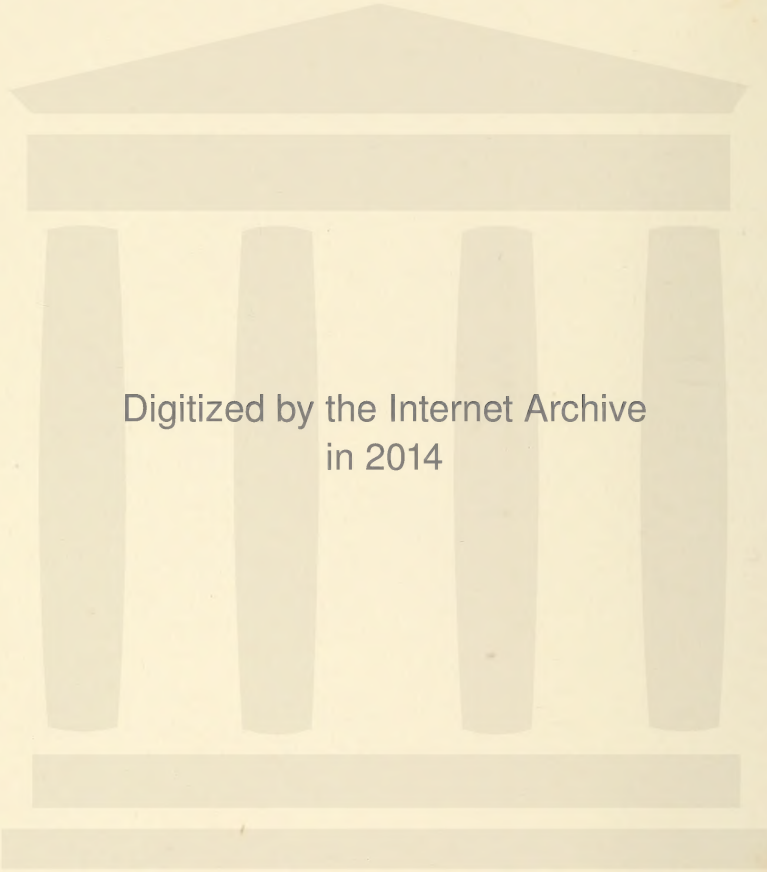


Sixth Annual Report

**COMMISSION OF CONSERVATION  
CANADA**

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**1915**



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J. H. Gallrath







## Commission of Conservation

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*Constituted under "The Conservation Act," 8-9 Edward VII., Chap. 27, 1909, and  
amending Acts, 9-10 Edward VII., Chap. 42, 1910, and 3-4 George V.,  
Chap. 12, 1913.*

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### Chairman :

SIR CLIFFORD SIFTON, K.C.M.G.

### Members :

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DR. HOWARD MURRAY, Dalhousie University, Halifax, N. S.  
DR. CECIL C. JONES, Chancellor, University of New Brunswick, Fredericton,  
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MR. WILLIAM B. SNOWBALL, Chatham, N. B.  
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DR. FRANK D. ADAMS, Dean, Faculty of Applied Science, McGill University,  
Montreal  
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MR. EDWARD GOHIER, St. Laurent, Que.  
DR. JAMES W. ROBERTSON, C.M.G., Ottawa, Ont.  
SIR SANDFORD FLEMING, K.C.M.G., Ottawa, Ont., Chancellor, Queen's University  
HON. SENATOR WILLIAM CAMERON EDWARDS, Ottawa, Ont.  
SIR EDMUND B. OSLER, M.P., Toronto, Ont.  
MR. CHARLES A. MCCOOL, Pembroke, Ont.  
MR. JOHN F. MACKAY, Business Manager, "The Globe," Toronto, Ont.  
DR. BERNARD E. FERNOW, Dean, Faculty of Forestry, University of Toronto,  
Toronto, Ont.  
DR. GEORGE BRYCE, University of Manitoba, Winnipeg, Man.  
DR. WILLIAM J. RUTHERFORD, Member of Faculty, University of Saskatchewan,  
Saskatoon, Sask.  
DR. HENRY M. TORY, President, University of Alberta, Edmonton, Alberta  
MR. JOHN HENDRY, Vancouver, B. C.

### Members, ex-officio :

HON. MARTIN BURRELL, Minister of Agriculture, Ottawa  
HON. WILLIAM J. ROCHE, Minister of the Interior, Ottawa  
HON. LOUIS CODERRE, Minister of Mines, Ottawa  
HON. JOHN A. MATHIESON, K.C., Premier, President and Attorney-General,  
Prince Edward Island  
HON. ORLANDO T. DANIELS, Attorney-General, Nova Scotia  
HON. GEORGE J. CLARKE, Premier and Minister of Lands and Mines, New  
Brunswick  
HON. JULES ALLARD, Minister of Lands and Forests, Quebec  
HON. G. H. FERGUSON, Minister of Lands, Forests and Mines, Ontario  
HON. A. B. HUDSON, Attorney-General, Manitoba  
HON. JAMES A. CALDER, Minister of Railways and Highways, Saskatchewan  
HON. ARTHUR L. SIFTON, Premier, Minister of Railways and Telephones, Alberta  
HON. WILLIAM R. ROSS, Minister of Lands, British Columbia

### Assistant to Chairman and Deputy Head :

MR. JAMES WHITE



# Commission of Conservation Canada

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SIR CLIFFORD SIFTON, K.C.M.G., Chairman  
JAMES WHITE, Assistant to Chairman and Deputy Head

## REPORT OF THE SIXTH ANNUAL MEETING

HELD AT OTTAWA

JANUARY 19-20

1915



BRYANT PRESS LIMITED, TORONTO

# Committees of the Commission of Conservation, 1915

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## **Committee on Fisheries, Game and Fur-Bearing Animals**

Dr. C. C. Jones, Chairman ; Hon. George J. Clarke, Hon. O. T. Daniels, Hon. W. H. Hearst, Hon. A. B. Hudson, Hon. J. A. Mathieson, Dr. Howard Murray, Dr. J. W. Robertson, Hon. W. R. Ross.

## **Committee on Forests**

Senator W. C. Edwards, Chairman ; Dr. Frank D. Adams, Dr. B. E. Fernow, Mr. John Hendry, Hon. William J. Roche, Mr. W. B. Snowball, and the ex-officio Members of the Commission who represent the various Provinces.

## **Committee on Lands**

Dr. J. W. Robertson, Chairman ; Dr. George Bryce, Hon. Martin Burrell, Mgr. C. P. Choquette, Mr. E. Gohier, Dr. C. C. Jones, Dr. W. J. Rutherford, Dr. H. M. Tory, and the ex-officio Members of the Commission who represent the various Provinces.

## **Committee on Minerals**

Dr. Frank D. Adams, Chairman ; Mgr. C. P. Choquette, Hon. Louis Coderre, Mr. John Hendry, Dr. Howard Murray, and the ex-officio Members of the Commission who represents the various Provinces.

## **Committee on Press and Co-operating Organizations**

Mr. J. F. MacKay, Chairman ; Hon. Jules Allard, Dr. George Bryce, Dr. Howard Murray, Dr. H. M. Tory.

## **Committee on Public Health**

Sir Edmund B. Osler, Chairman ; Hon. H. S. Béland, Hon. Martin Burrell, Hon. J. A. Calder, Sir Sandford Fleming, Dr. Cecil C. Jones.

## **Committee on Waters and Water-Powers**

Hon. H. S. Béland, Chairman ; Hon. Jules Allard, Hon. George J. Clarke, Hon. G. H. Ferguson, Mr. C. A. McCool, Hon. W. R. Ross.



TO FIELD MARSHAL, HIS ROYAL HIGHNESS PRINCE ARTHUR WILLIAM  
PATRICK ALBERT, DUKE OF CONNAUGHT AND OF STRATHEARN,  
K.G., K.T., K.P., &c., &c., GOVERNOR GENERAL OF CANADA.

MAY IT PLEASE YOUR ROYAL HIGHNESS :

The undersigned has the honour to lay before Your Royal Highness the Sixth Annual Report of the Commission of Conservation for the fiscal year ending March 31, 1915.

Respectfully submitted,

CLIFFORD SIFTON,

*Chairman.*

OTTAWA, April 3, 1915.

OTTAWA, April 2, 1915

SIR :

I have the honour to transmit herewith the Sixth Annual Report of the Commission of Conservation. This contains a report of the proceedings of the Sixth Annual Meeting, held in Ottawa on January 19-20, 1915, in which is included summary statements of the work done under the several committees of the Commission, during the fiscal year ending March 31, 1915.

I have the honour to be, Sir,

Your obedient servant,

JAMES WHITE,

*Assistant to Chairman.*

SIR CLIFFORD SIFTON, K.C.M.G.,

Chairman,

Commission of Conservation.



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PANORAMIC VIEW OF ST. JOHN, NEW BRUNSWICK

This is a portion of the area to be included in the town planning scheme now in course of preparation. St. John has shown enterprise in getting power to prepare the first statutory town planning scheme in Canada, as well as by its courage in dealing with a large area outside the city. Most of the land already built upon in the city will be excluded from the scheme, the object being, primarily, to deal with future development, and not to remedy existing bad development on any large scale.



PROCEEDINGS  
OF THE  
SIXTH ANNUAL MEETING  
OF THE  
COMMISSION OF CONSERVATION  
HELD AT  
OTTAWA, JANUARY 19 AND 20, 1915

**T**HE Sixth Annual Meeting of the Commission of Conservation was held in the Board Room, Temple Building, Ottawa, on January 19 and 20, 1915. The following Commissioners were present :

Sir Clifford Sifton, K.C.M.G., Chairman  
Dr. Frank D. Adams, Montreal, Quebec  
Dr. George Bryce, Winnipeg, Manitoba  
Hon. Senator William C. Edwards, Ottawa, Ontario  
Dr. Bernard E. Fernow, Toronto, Ontario  
Dr. Cecil C. Jones, Fredericton, New Brunswick  
Mr. Charles A. McCool, Pembroke, Ontario  
Mr. John F. MacKay, Toronto, Ontario  
Dr. Howard Murray, Halifax, Nova Scotia  
Dr. James W. Robertson, Ottawa, Ontario  
Dr. William J. Rutherford, Saskatoon, Saskatchewan  
Mr. William B. Snowball, Chatham, New Brunswick  
Dr. Henry M. Tory, Edmonton, Alberta

The morning session was opened at 10 o'clock, with the Chairman, Sir Clifford Sifton, presiding. The minutes of the previous annual meeting were read and approved. Telegrams and letters of regret at inability to be present at the meeting were received from Hon. Jules Allard, Hon. A. E. Arsenault, Mr. G. Frank Beer, Monseigneur C. P. Choquette, Hon. O. T. Daniels, Mr. John Hendry, Dr. Johann Hjort, Hon. J. H. Howden, Hon. W. R. Ross and Hon. Arthur L. Sifton.

## Annual Address of Chairman

BY

SIR CLIFFORD SIFTON

**L**ADIES and Gentlemen : I need not tell you that I am very glad to be with you again at the annual meeting of our Commission, and I trust that the deliberations of the present meeting will be as fraught with useful results as those of former years have been.

It becomes my duty, according to our usual custom, to present to you a short review of the work of the last year. Like other public bodies, we are working under the shadow of the great war, which has burst upon the world since our last meeting. Our own body has not been immune from being directly affected. One of our members, Dr. Béland, after taking an active, useful and self-sacrificing part in the care of the wounded in Belgium, himself suffered a more or less serious injury at the siege of Antwerp, and, so far as we can learn, is now detained as a prisoner in the hands of the enemy. We shall, I am sure, all entertain the hope that our brilliant colleague, Dr. Béland, will be able to return safely to his duties in Canada.

Work of Late  
Col. Burland

At our last meeting we had the pleasure of the presence of the late Col. Jeffrey Burland, of Montreal, who, with his usual self-sacrificing disposition, had come to give us the benefit of his counsel with regard to town planning legislation. Col. Burland had accepted a position upon the Committee of the Commission having in charge the preparation of the first draft of a bill. He was subsequently appointed Chief Commissioner of the Canadian Red Cross Association and proceeded to England. It was with the greatest regret that we heard of his premature and wholly unexpected demise while acting in that capacity. I have only to say that my acquaintanceship with Col. Burland, extending over a number of years, justifies the statement that throughout a lifetime of usefulness he was an honour and an ornament to Canadian citizenship.

Our chief medical adviser, Dr. Hodgetts, was immediately called to take the place of Col. Burland. I did not hesitate to authorize the temporary abandonment of his work here, in view of the fact that the executive of the Red Cross Association considered him the best qualified man available for the work which they had in hand. I understand that Dr. Hodgetts is performing his duties in England, as we all expected he would do, with great skill and acceptability.



Necessarily, the absence of Dr. Hodgetts interferes a good deal with the work of his branch, but that is a sacrifice which we will have to make, in common with many others, called for by the special circumstances of the case.

### TOWN PLANNING ORGANIZATION

The most outstanding feature of our work during the last year has been in connection with the subject of town planning. With the approval of the Prime Minister, it was arranged that our Commission should act as the host of the National Town Planning Association, at its convention held in the city of Toronto during the spring of the year 1914. Appropriation was made for the necessary expenses, and our officers undertook the work which the arrangements imposed upon them. His Royal Highness, the Governor-General, honoured the convention by attending in person and delivering an address, which will be found, *in extenso*, in the printed proceedings. The convention was in every respect a pronounced success, and, undoubtedly, helped to create in the public mind a better understanding of the questions involved in what may be described as the science of town planning.

#### Plans for Future Work

It will be quite obvious to the members of the Commission, that in view of the efforts made to secure town planning legislation, and the general status of the subject in Canada, the time had come to take a step which might be expected to produce something in the nature of definite results. We have taken this step by securing the services of Mr. Thomas Adams, who is rightly regarded as one of the foremost and ablest authorities upon the subject. He has now been with us for some months, and we shall hear from him upon the subject which is his peculiar charge during our present meeting. I may close this portion of my remarks by saying that I am determined that during the time Mr. Adams will be with us, we shall make use of his services in such a way as to secure definite and tangible results.

### LANDS AND AGRICULTURE

For 1914, the work of the Committee on Lands has been, as was proposed at the annual meeting held at Ottawa in January of last year, the continuation of the work conducted during 1913. It may be outlined as follows :

1. The obtaining of reliable data for guidance in future operations by means of the agricultural survey work. The survey this year was conducted in the same districts as were visited in 1913.

2. The directing of operations upon the 33 Illustration Farms selected by the Commission in 1912-13.

3. Making observations of conditions and progress of alfalfa investigation plots in Quebec.

4. The addressing of meetings held on the Illustration Farms, and other agricultural meetings where such could be conveniently arranged.

5. The preparation of a number of special press bulletins and of articles for *Conservation*.

#### Agricultural Survey

The agricultural survey work this year was conducted on the same farms as were visited last year.

By visiting the same farms for two successive years more reliable information was obtained, and the risk of getting unreliable figures, due to exceptional seasonal conditions, was greatly lessened. The survey has included the following :

1. An investigation of areas under crops, crop rotation, crops used, seed selection, varieties of seed used, amounts seeded to clover and alfalfa, amounts of seed sown per acre, comparison of yield with that of ten and twenty years ago, and the uses of manures and fertilizers.

2. An investigation of weed pests, insect pests and plant diseases, with special reference to their prevalence and the time when they were first introduced to the farm, whether increasing or decreasing, estimated loss, causes responsible for the foregoing, and the preventive measures adopted.

3. An investigation of the fuel, power and water supplies. Special attention has been paid to the length of time the fuel supply will last ; to the reforestation of present waste land and the results of planting, where any has been done ; the motive powers for house, farm and field work ; the source and location of water supply for house use and for stock, the distance from possible sources of contamination and how conveyed to the house ; and conveniences in the houses for conserving human energy.

4. The obtaining of information regarding the amount of stock kept and sold annually ; the amount of hay and grain sold and fed annually, the labour problem on the farm ; the care and life of the farm implements ; the drawbacks to profitable continuation of the present systems of farming ; and the branches of farming specialized in.

Fewer men (six in all) were employed in 1913 to circulate the printed question schedules among the farmers, as it was thought





FOUR YEAR ROTATION ON A COMMISSION OF CONSERVATION ILLUSTRATION FARM IN QUEBEC  
A short rotation maintains fertility, increases production and destroys weeds.



#### ALFALFA SOWN WITHOUT A NURSE CROP

This field in Norfolk Co., Ont., was seeded in the spring of 1914, and was clipped twice during the summer. The photograph, taken on September 9th, 1914, shows a strong growth which will protect it during the winter.



that more uniform results could be obtained in this way. With the exception of one man, those who did this work in 1914 had previously done similar work for the Commission. The information desired was obtained from personal observation by these men and the testimony of the farmers, and is now tabulated ready for printing.

**Illustration  
Farms**

During the year 1914, the agriculturist and the travelling instructors of the Commission have had under their supervision the work on the Illustration Farms which they had previously selected. Regular visits, about one each month, were made to the several farms for the purpose of conferring with the farmers regarding their operations and giving them assistance and instruction in the use of such means and methods as would increase the profits from the farm while maintaining or increasing the fertility of the soil and keeping the farm clean. Some of the lines of work encouraged and undertaken were : The sowing of the best known varieties of grain of the best quality obtainable in varying quantities per acre, to ascertain the most suitable rate of seeding; the sowing of different amounts of clover and timothy seed per acre, of both home-grown and purchased seed for comparison; the practising of after-harvest, extra and more thorough cultivation to kill weeds, conserve moisture and increase yields; the economical production and care of farm-yard manure, together with the testing of various methods of applying it; the sowing of various summer pasture mixtures; the introduction of labour-saving devices and up-to-date machinery; the planning and starting of a suitable systematic rotation of crops for the farm and locality; the encouragement of the growing of gardens on the farm, and many other means to make farming more profitable and the farm life more satisfactory and pleasant, so as to retain the young people on the farms.

**General Aspects  
of the Work**

The work of the Commission in the domain of agriculture must be regarded as having led to the most important practical results. The inauguration of this Commission was coincident with the beginning of a campaign throughout the Dominion for the improvement of agriculture. It was taken up enthusiastically, and the good work which had been done by the various Departments of Agriculture was brought to the attention of the public and recognized more fully than ever before. This has resulted in the strengthening of public opinion and in the creation of public demand for more effective action by governmental agencies. The concrete result has been found in the appropriation of a very large sum of money by the Federal Government for the promotion of improvements in agriculture. In regard to our own work, it must be said that, having attained the practical results aimed



at in the stimulation of public opinion and in liberal and decisive action on the part of the Federal Government, our work is largely done. It is not our business to conduct a department of agriculture, and obvious inconveniences will arise if, even upon a small scale, we continue the work which we have been doing. It must not be forgotten that this work has been for the purpose of educating, not so much the individual farmer with whom our instructors come in contact, as the general public whom we desire to urge to efforts on a very much larger scale than those which are possible under our direction. It is probable that nothing has contributed more to the stiffening of public opinion upon the subject than the results which have been published by our Committee on Lands. Arrangements are now under discussion which will result in the Illustration Farms being turned over to the Department of Agriculture at the close of the present fiscal year. The Minister of Agriculture agrees to carry on the work along the lines on which it has been inaugurated by Dr. Robertson.

Reforms due to  
Dr. Robertson

I cannot close my remarks upon this subject without calling particular attention to the valuable work which has been done in this connection by our friend, Dr. Robertson. There need be no doubt of the great value of the work which has been done by the Illustration Farms, and they are entirely the work of Dr. Robertson. According to my recollection, it is now some fourteen years since Dr. Robertson first urged upon the Federal Department of Agriculture the institution of Illustration Farms of the character which he has established in connection with our work. The department and the Government were not apparently prepared at that time for the advanced views that were pressed upon them, and the effort was at that time unavailing. Dr. Robertson will have the satisfaction of knowing that what he was not able to do fourteen years ago, by reason of the inertia of the Government, he has been able to accomplish through the medium of this Commission, and that the Illustration Farms will henceforth constitute an important and permanent feature of the work of the Department of Agriculture. It is now proposed to turn the attention of the Committee on Lands to special investigation and study of other subjects which closely concern the agricultural advancement of the provinces of Ontario and Quebec, in the hope that some practical solution will be worked out.

#### WORK OF THE COMMITTEE ON MINERALS

For two years previous to the 1914 meeting, the Committee on Minerals had been without a Chairman, and, in the absence of a

member specially qualified to direct the Committee on Minerals, the work was largely confined to the collection of necessary information.

At the last annual meeting, Dr. Frank D. Adams, Dean of the Faculty of Applied Science, McGill University, was appointed to the chairmanship. We shall have the pleasure of hearing from Dr. Adams on "Mineral Resources and the Problem of their Proper Conservation" during the present meeting of the Commission.

#### Power Survey of Canada

At the present time, there is under way in this branch of our work, a power survey as distinguished from a water-power survey. The information, when completed and tabulated, will give the amount and proportion of the different kinds of power or of power generated by the different methods, such as water-power and steam-power produced by the use of coal, gas and oil. The purposes for which the power is used, the cost of the different kinds of power, source of fuel supply and other particulars which are likely to be of value, will be considered and dealt with. This data will show the relative advantages of the different kinds of power from the standpoint of cost of production and method of use.

During the year our mining engineer has been called upon to furnish reports on "Briquetting of Coal in Western Canada"; "Mine Rescue Work"; "First-aid in Case of Accidents"; "The Trade with Belligerent Countries," and other matters coming within the purview of his department.

The Dominion Railway Commission has on several occasions consulted the Commission with regard to the use on the railways of certain coals, the use of which is regarded as being the cause of railway fires. In this connection, recommendations have been made with a view to providing a practicable method of overcoming the difficulty.

During the year, there has been important work done and legislation passed with regard to the following subjects :

1. Fuel testing
2. New legislation affecting conservation of natural gas
3. Safety in coal mines
4. First-aid work in mine accidents

Details of the progress made in the above branches will appear in a report of this branch.

#### FISHERIES, GAME AND FUR-BEARING ANIMALS

During the year 1914, the important industries depending upon game and fur-bearing animals have, in common with most other industrial interests, met with many vicissitudes.

**Fur-Farming  
during 1914**

In the case of fur-farming the phenomenal development of 1913 seemed likely to be surpassed in 1914.

Early in the year many companies were formed. Some of these doubtless based their capitalizations on tested fox stock, but there seems to be good reason for believing that others were based largely on options on unborn foxes. This scheme, even under the best conditions, would have proven dangerous to investors. The year proved to be very unfortunate for many breeders, who lost several of their foxes through death. To this condition, the European war has added further depression so that the possibility is that some of the option companies will meet with disaster.

**Condition of the  
Fur Industry**

The European war has created hitherto unknown conditions in the fur business. The world's leading markets in London, Leipzig, and Nijni Novgorod have been practically closed. The regular semi-annual auctions at these points have made them Meccas for fur merchants from all parts of the world. From reports it would seem that the outbreak of hostilities found considerable reserve supplies in the hands of the dealers in these leading markets. In 1913, Canada exported dressed furs to the value of \$15,306 and raw furs to the value of \$5,150,833. If we add to this the exports of the United States, it will be found that about \$22,000,000 of raw and dressed furs were exported from America in 1913. This was offset by imports into Canada of \$1,327,000 which, added to the imports into the United States, make total imports of \$20,500,000. The closing of the above markets and the unsettled financial conditions resulting from the war must prove, for the present, very injurious to the fur industry.

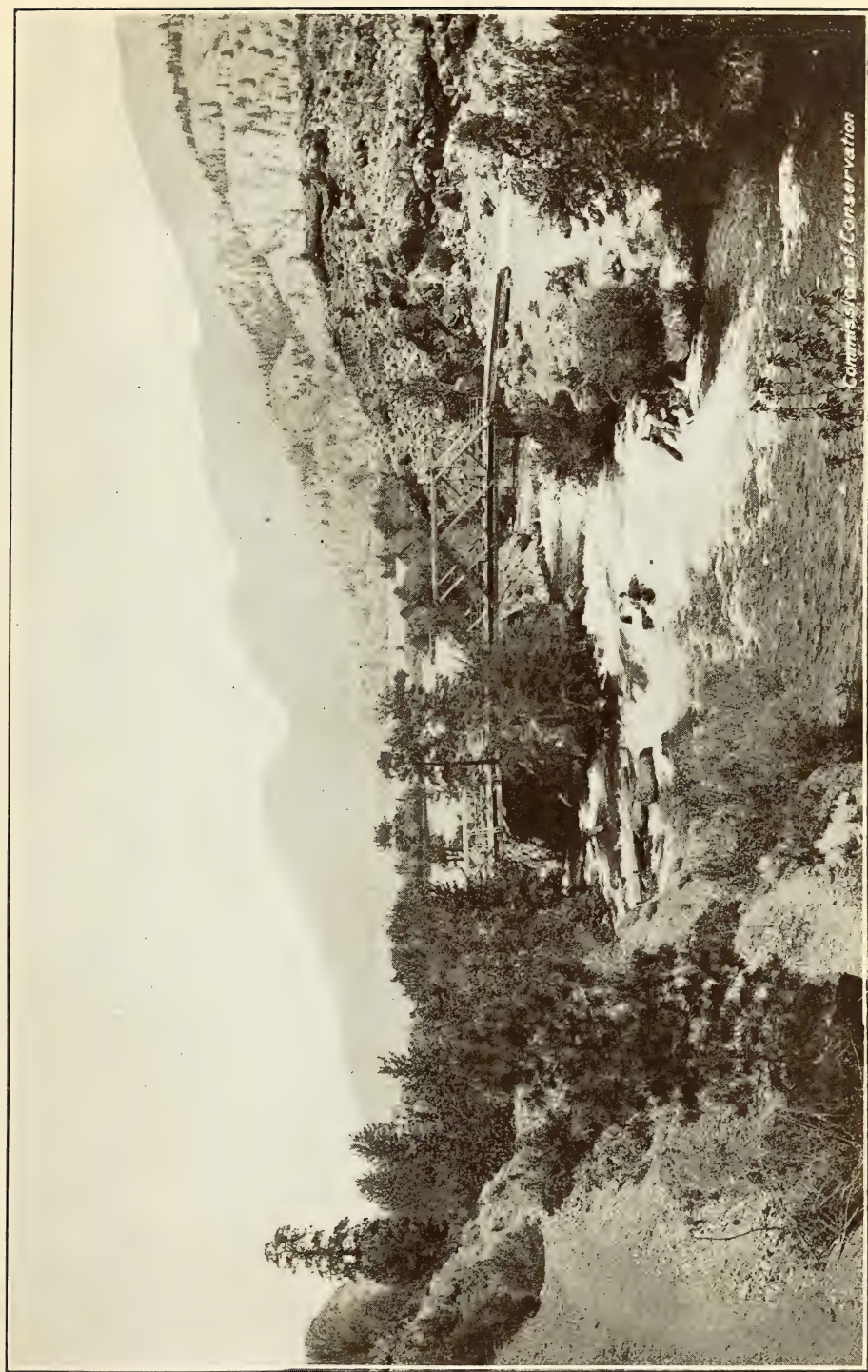
**The War and  
the Fisheries**

Especially since the outbreak of the war efforts have been made to keep in touch with the fisheries conditions, particularly on the Atlantic coast. At the request of the Chairman of the Fisheries Committee, a member of the editorial staff obtained information with respect to the fresh sea-fish industry. At present, the influence that the war will exert on the fisheries is perhaps the feature of greatest interest to Canadian fishermen. Canada's total production of fish for the years 1909-10 to 1913-14, inclusive, was as follows :

1909-1910. ....	\$29,629,129
1910-1911. ....	29,965,433
1911-1912. ....	34,667,872
1912-1913. ....	33,389,464
1913-1914. ....	33,207,748

The exports of fish to Austria-Hungary during those years was negligible, only \$2,700 being so disposed of in 1913 and none at all





*Columbia River Conservation*

OKANAGAN FALLS, OKANAGAN RIVER, SOUTHERN BRITISH COLUMBIA



for the years before that. Germany, however, was a much better customer, taking in 1913-14, in value, \$350,004.

This market is of course lost during the war. The United Kingdom on the other hand has been one of the largest purchasers of Canadian fish, in spite of the fact that considerable quantities of fish taken by British fishermen in the North Sea hitherto found their way to Germany. The present demoralization of the North Sea fisheries, however, should mean an increased demand for Canadian fish in the British market, so that it is probable the loss of the German market will be more than made up in the British. As to the lobster fishery the unusual financial stringency immediately tended to check sales. In 1913-1914 the exports of lobsters amounted to 8,318,656 pounds. Of this amount Great Britain purchased 2,907,990 pounds; the United States 2,273,849 pounds; France 1,946,674 pounds; Germany 487,016 pounds and Belgium 299,728 pounds. The European market is already demoralized and the prospect of working up the home market sufficiently to absorb the surplus pack does not seem very bright. Certain packers have advocated the establishment of a close season for one year. This, they claim, would serve the double purpose of permitting the packers to dispose of the last season's surplus catch and, at the same time, give the industry a chance to recuperate from the long period of over fishing to which, it is asserted, it has been subjected. On the other hand, the fishermen naturally object to this important source of their livelihood being so seriously curtailed. The Department of Marine and Fisheries will, in all probability, endeavour to provide a reasonable compromise.

#### WATER AND WATER-POWERS

As it was considered that sufficient data were available for the report on the "Water-Powers of Manitoba, Saskatchewan and Alberta," no field work in that connection was undertaken this year. Attention was directed towards assembling and arranging into proper form all the information to be included in this report. The manuscript of the report is now completed and ready for printing and it is expected that its publication will proceed without delay.

When our report on the "Water-Powers of Canada" was published in 1911, it was found that the information covering the Prairie Provinces and British Columbia was very incomplete. It was then decided to publish more exhaustive reports on these provinces later on, and the object of the report above referred to is to fill this want for the Prairie Provinces and certain portions of the North West Territories.



**Sources of Information**

The sources of information from which the material for this report were obtained may be divided into three classes : First, data obtained from recent investigations by branches of the Department of the Interior which have been especially established for the study of waters and water-powers. From the Water Power Branch we obtained valuable information from their thorough investigation of the Winnipeg River power concentrations and other smaller rivers of Manitoba. On the eastern slope of the Rockies the same Branch also investigated the Bow River basin and their report on the power and storage of this river supplied very comprehensive and complete data. The two districts just mentioned in Manitoba and Alberta practically comprise the most important water-power sites in the southern portion of the Prairie Provinces and two chapters of our report summarizing the results of the Water Power Branch's investigations were supplied by the Superintendent, Mr. Challies.

The other source of information comes from the Irrigation Branch of the same Department. This Branch has an excellent organization operating stream-gauging stations in Alberta and Saskatchewan. Primarily, this work was carried on upon the smaller streams in connection with irrigation, but was afterwards extended to include the main arteries. Its reports and investigations supplied valuable information on the flow of streams in the southern part of the provinces just mentioned ; this is given in our report in tabular form covering a certain number of years for each stream.

The second source of information comprises the streams in the district immediately north of the more settled portion of the provinces ; the principal rivers are the Athabaska, Peace, Slave and Nelson. The power possibilities on these and other minor ones were investigated by reconnaissance surveys undertaken by our staff, and the information thus obtained has also been included in our report.

Under the third source may be classed all data compiled from the Geological Survey and other reports on investigations in which waters and water-powers do not figure as the principal object. All information of interest in connection with water and water-powers contained in these reports has been carefully extracted and added to the data obtained from other sources. Thus it has been possible to include limited descriptions of streams in the far north and on which very few explorers have travelled.

**Water-Powers of British Columbia**

With regard to our proposed report dealing with the water-powers of British Columbia, considering all the various matters which have demanded attention, it was decided that there was much to gain, and little to lose, by

carrying the publication of the British Columbia report forward to 1915. A special effort has been made to advance this work as the Commission is sensible of its obligation to the British Columbia Department of Lands, for liberal financial assistance rendered in connection with the necessary field work. It is believed that, when our report is issued, it will be of considerably greater value than would have been the case if published at an earlier date.

#### **Water Works of Canada**

A new edition of the work on "Water Works of Canada" is well under way. The material collected still remains to be arranged in convenient form for publication but it will shortly be ready for the printer. In addition to data on water-works systems, information on sewerage and sewage disposal has also been obtained. In this connection a few figures showing conditions on our inland waters are of interest. The well-known undesirable conditions may be summed up in a few words. One or more municipalities discharge raw sewage into a system of inland waters at points below which other municipalities obtain their domestic water-supply, thus endangering the source of supply of the lower municipalities. The information gathered reveals the fact that, in Canada, 57 systems of inland waters receive raw sewage from 159 municipalities, while 111 water-supply systems obtain their water from streams or bodies of water into which raw sewage has been discharged above the intake points. Good progress, however, is to be noted in the installation of sewage treatment plants, of which there are now 61 in operation in Canada.

#### **Hydro-Electric Development**

It is gratifying to note the rapid strides made in Canada in hydro-electric developments. A very large hydro-electric plant has been under construction on the St. Lawrence river at Cedar rapid, about 30 miles above Montreal, with an initial rating of 100,000 h.p., to be increased later to 160,000 h.p., making it one of the largest generating stations in Canada. The Shawinigan Water and Power Company, whose transmission lines embrace the most populous portion of the province of Quebec on both sides of the St. Lawrence, has, by the addition of a second plant on the St. Maurice river, raised its total installed capacity to 145,000 h.p. Each of the units in the new plant has a capacity of 20,000 h.p. The Kaministiquia Power Company of Fort William is adding a 12,000 h.p. unit to its installation which will bring the total capacity to 34,000 h.p. The Calgary Power Company has recently put in operation its second plant on the Bow river at Kananaskis fall, their first plant being at Horseshoe fall, one and a half miles below, on the same river. This second plant has a capacity of 12,000 h.p. which brings the total of the two plants

to 30,000 h.p. The Hydro-Electric Power Commission of Ontario has also shown marked advances in its operations and one of the best proofs of its success is given by the fact that one of the largest states across the line is said to be contemplating the adoption of a very similar policy.

**What the  
Provinces  
Are Doing**

In the province of Quebec, the Quebec Streams Commission has more than justified its existence. The principal object of this Commission is to help and encourage the conservation and storage of water, and it now has under study a very important storage undertaking in connection with the upper waters of the St. Maurice river. The engineers of the Commission have been investigating this scheme thoroughly, and are designing the works connected with it. The progressive work of the two branches of the Interior Department in the Prairie Provinces has already been referred to. In British Columbia, the Water Rights Branch of the Department of Lands is pursuing its stream investigations. This work during the last season has been more specially in the Okanagan valley and comprises topographic work, power-site and reservoir investigations and the operation of stream-gauging stations.

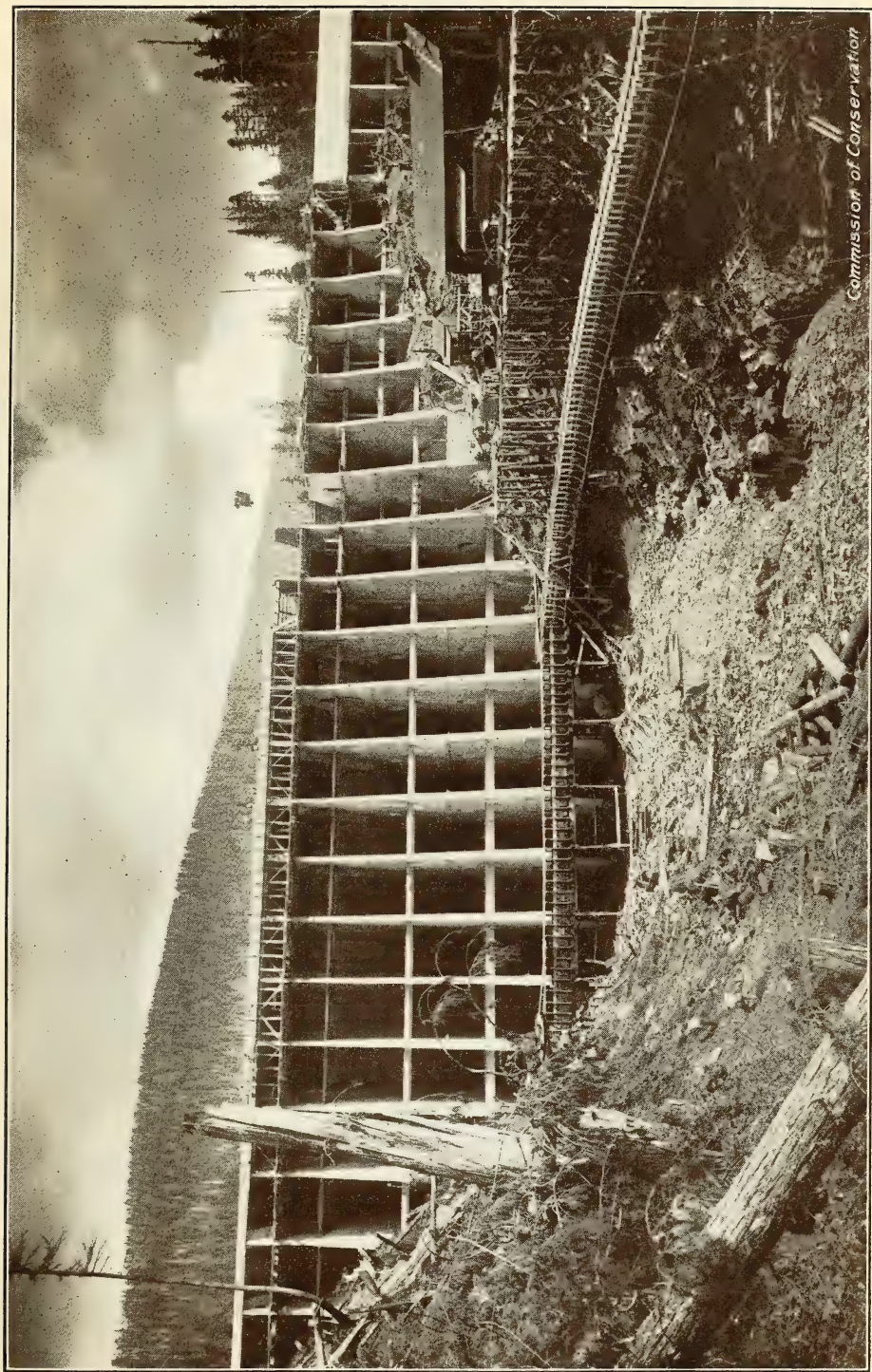
All these activities go to show the rapidly increasing importance of water conservation and storage and the extensive work which is being done in that connection. The present position is in striking contrast to that which existed when this Commission was inaugurated, at which time there was little systematic work being done and little public or governmental recognition of its necessity.

**Long Sault  
Rapids**

You are familiar with what has been done in connection with the Long Sault Power project. It will, therefore, be of interest to you to be informed that in October, 1914, the Power Company filed an application requesting the privilege of reopening its case, the object being to re-establish the status of the Long Sault Development Company with respect to its former charter from the state of New York. Canadian interests are closely bound up with any movement that may be made in that direction and the subject, therefore, calls for constant vigilance and attention.

It is to be noted that in the United States, generally, the movement to monopolize the water-powers moves steadily on. On December 16, 1914, at Washington, Mr. Gifford Pinchot, appearing before the Committee dealing with a new water-power bill, made the statement that, "during the last two years the large grouping of water-power interests increased their control of undeveloped water in the United States by 2,050,000 h.p." Mr. Pinchot maintained





VANCOUVER ISLAND POWER CO.'S DAM, JORDAN RIVER, VANCOUVER ISLAND  
The extreme height of dam is 126 feet.



that the figures would show that in the last two years the great power interests have increased their control of power held undeveloped more than twice as fast as they have increased their developed power.

**Chicago Sanitary District Case** It will be recalled that the Secretary of War for the United States authorized the Sanitary District of Chicago to take from the waters of lake Michigan 250,000 cubic feet per minute and no more. It appears that the District has not respected the finding of the War Department and the Attorney-General of the United States has brought action seeking an injunction. It is said that more than double the authorized quantity has at times been diverted. We joined in the protest against an extensive diversion of water by this body, and undoubtedly Canadian representations weighed materially in leading to the decision which was arrived at. We are naturally interested in the success of the efforts of the Attorney-General of the United States to compel observance of the legal restrictions.

**Disposal of Power at Niagara** There is a somewhat complex situation along the Niagara river. Much energy is being devoted to procuring hydro-electric legislation applicable to the Niagara river. The purpose of this legislation is to bring about a condition of affairs under which the surplus of Canadian power will be taken by export to the United States so that a vested claim, if not a vested right, may be acquired to the continued export of such power even after it is required on the Canadian side. There have been discussions by public men and public bodies which make it clear that there is a considerable shortage of power in the state of New York ; that there is an insistent demand for further development and that the authorities of the state of New York do not regard it as a reasonable exercise of Canadian sovereign power to prohibit the export of such power after it has been used upon the American side and industries have been built up which depend upon Canadian power for their existence. Obviously, the case is one which requires the utmost caution and foresight upon the part of those who are charged with the care of our interests, such foresight being required as well to preserve the material interests of Canada as to avoid the possibility of international complications in the future.

**Water Storage Lake of the Woods** An important work to which passing reference may be made is that which is being conducted by the International Joint Commission, in order to ascertain to what extent the waters of the lake of the Woods may be regulated



by storage and upon what particular regulation the parties concerned may agree with respect to the use of these waters. The Canadian section has requested Mr. Arthur V. White to assist the International Joint Commission in this important work and Mr. White has been permitted to take such time as is necessary for that purpose.

It may be stated generally that wherever upon the international boundary, waters are used for any economic purpose, (apart from navigation) interests will arise requiring the most careful scientific investigation and extreme caution on the part of those who are charged with the protection of Canadian interests.

### PROGRESS IN FORESTRY

In the matter of forest protection, the general aspects of the situation have not changed materially since our last meeting, though there have been improvements in some respects.

The fire season of 1914 was the worst since 1910 and the aggregate of loss will be heavy. Had it not been for the fire protective organizations established during the last three years, the loss might have approached the dimensions of a national disaster. Results have shown that these organizations are effective, but need strengthening to provide really adequate protection. In practically all cases, larger appropriations are needed, especially for the protection of young forest growth. This action, wherever practicable under present conditions, is fully justifiable on the ground that fire protection must be regarded not as an expense, but as an investment; necessary in the public interest and one which will pay high dividends in the future.

#### **Inventory of Forest Resources**

The inventory of forest resources, begun in British Columbia and Saskatchewan in 1913, has been continued during the past year.

As indicated last year, there is strong reason for the belief that the forest resources of Canada have been much over-estimated, and the necessity for a general stock-taking is obvious, in order to provide the basis for a comprehensive plan for intelligent conservation.

In British Columbia, during 1913 and 1914, data have been collected covering over 200,000 square miles, at an average cost of about six cents per square mile. The explanation of this low cost lies in the fact that a very large amount of detailed information has been previously collected at great cost by the British Columbia Forest Branch, the Dominion Forestry Branch, the Canadian Pacific Railway Forestry Branch, and a great many limit-holders. Practically all this information has been placed at the disposal of our investigators and has been supplemented to a limited extent by further

data collected by them at first hand, on the ground. Without the admirable co-operation of all these agencies the results which are being secured would be impossible except at a cost to the Commission that would be prohibitive. It is hoped that with one more year's work, the report on the timber resources of British Columbia will have been completed. In addition to the descriptive text, this report will include maps showing land classifications, forest regions, silvicultural types, and range of the principal tree species.

In Saskatchewan, the work to date has covered some 60,000 square miles, but the information collected on a part of this area is not complete, on account of the fact that financial considerations made it necessary to discontinue the project. At least another year should be devoted to completing the work in Saskatchewan, but it does not seem possible to carry it forward during 1915. The investigations already made show that the total amount of spruce in the timber limit belt of Saskatchewan is discouragingly small, especially in proportion to the vast area over which this timber is scattered. Fire has been largely responsible for this situation, and the need is emphasized for more adequate fire protection.

The indications, from this uncompleted investigation, are that of spruce saw-timber, there are in that portion of the province of Saskatchewan accessible by present logging methods some two thousand one hundred million feet board measure. This area comprises 27,000 square miles and includes all the timber limits, for which specific estimates have been secured from most of the limit-holders. Between this timber-limit belt and the Churchill river is another area of 33,000 square miles, with no timber limits, and for which the incomplete data available indicate a total stand of one thousand two hundred million feet of spruce saw timber, generally inaccessible under present conditions. North of the Churchill river is another vast area of 88,000 square miles, on which the timber is generally poor and scattered. Assuming this vast inaccessible area to contain two hundred million feet of spruce saw timber, we have, roughly, for the whole of Saskatchewan, a total of only 3,500 million feet of spruce saw timber, of which not quite two-thirds is accessible at present.

While no detailed study has been made in Manitoba and Alberta, a very rough indication may perhaps be secured by applying the averages found in Saskatchewan. If this be done, we would have for Manitoba about 2,500 million feet of spruce and for Alberta some 6,000 million feet, making a rough total for the Prairie Provinces of 12,000 million feet of spruce saw timber.

While these figures are for the most part only rough approximations, they indicate clearly the depleted condition of these forests, which, beyond a doubt, contained many times their present stand of timber before the advent of the white man, an event which has so generally been followed by destructive fires. With adequate protection from future fires, these great areas would gradually re-establish their former productivity of timber wealth.

**Study of Forest  
Reproduction**

During the past summer an investigation was made by the Commission, to determine the conditions under which the reproduction of commercial tree species is occurring most advantageously in the coastal region of British Columbia. Particular attention was paid to the effect of fire upon the reproduction of Douglas fir, which is the most valuable and most widely distributed species in the southern portion of the province. The study was conducted by Dr. C. D. Howe of the Faculty of Forestry, University of Toronto. In this work the British Columbia Forest Branch co-operated by assigning a forest assistant to work with Dr. Howe, and by furnishing considerable information from the head office in Victoria. The report is now being put in shape for publication.

The report emphasizes the fact that the popular assumption that nature alone will provide satisfactorily for the replacement of valuable commercial forests on cut-over and burned-over lands is only partly true. Nature is oftentimes wasteful in her methods, and needs to be aided by man in order to secure the best results. This is particularly true with regard to forest resources. The detailed investigations made by Dr. Howe in British Columbia show, in the first place, that the burning of logging slash, at selected times and under proper supervision, not only greatly reduces the fire hazard, but favours the reproduction of Douglas fir by exposing the mineral soil. Repeated fires, however, and fires occurring during dry periods, not only destroy the young growth, but the seed trees as well, thus preventing or greatly retarding the establishment of a stand of commercial size. As a general rule, a sufficient number of seed trees is left after logging, so that one fire leaves enough for seeding purposes. Each fire thereafter, however, reduces them in proportionately larger quantities. Thus, through the diminution of seed trees, each fire makes it increasingly difficult to re-establish the forest by natural means. On this account, in many sections, reproduction of valuable species is wholly inadequate in amount, or is entirely lacking. Good results can be secured at relatively slight expense, by providing more adequate protection from fire on cut-over





YOUNG STAND OF LODGE-POLE PINE GROWING ON OLD BURN,  
BRAZEAU FOREST RESERVE, ALBERTA

Such areas require adequate protection from fire in order to reach maturity.



HEAVY SLASH AFTER TIE CUTTING, INTERIOR WET BELT TYPE, BRITISH COLUMBIA  
Fire hazard extreme. The brush should be burned at times when the fire can be controlled.  
This would prevent needless destruction by fire and would facilitate regeneration.



lands, especially those bearing young forest growth at the present time. The additional protection needed, naturally means the employment of a larger patrol force than has previously been practicable, on account of the limited funds available.

**Railway Fire Protection** Under the fire regulations of the Board of Railway Commissioners, the railway fire protection work has been continued along the lines of organization and policy established during 1912 and 1913. Steady improvement has taken place, and along hundreds of miles of railway lines, the fire protective organizations of the railway companies have proved the most effective, and in some cases the only organized agencies in those particular sections, for the extinguishing of fires. Some of the worst fires have been those which originated at a distance from the track and in many such cases the railways have been very effective in checking the spread of fires, for the origin of which they were in no wise responsible.

The Board has arranged for co-operation in the handling of its railway fire inspection work, with governmental fire-protective organizations, in all of the forest provinces, with the single exception of Nova Scotia. In that province, the situation reported a year ago still exists, and active co-operation is still pending, awaiting the appointment of a provincial forester, for which appointment provision has been made by law. Fire protection in general, and the railway situation in particular, would benefit greatly by the early appointment of a qualified man to the position.

At the last two annual meetings, attention was called to the need for more adequate control of railway fire protective work in a number of the provinces, along lines not subject to the Board of Railway Commissioners. This situation has to a considerable extent been cleared up during the past year.

Under the terms of the *Canadian Northern Railway Guarantee Act*, 1914, a number of provincially-chartered lines in the Canadian Northern system have been declared works for the general advantage of Canada, and thus come under the Board's jurisdiction. Of these, the most important are the Halifax and Southwestern, in Nova Scotia ; the Quebec and Lake St. John, in Quebec ; and the Irondale, Bancroft and Ottawa, in Ontario. Also the Canadian Northern Pacific, comprising the British Columbia lines of the Canadian Northern system, will come under the Board when it is completed and opened for operation.



The International railway of New Brunswick, a provincially-chartered line, has been absorbed into the Government Railways system. The International runs through an almost solid forest, so that its acquisition by the Intercolonial serves to emphasize the need for the adoption of the same fire-protective measures upon Government lines that are required by the Government, through the Railway Commission, upon lines privately-owned. Upon the International, in particular, there is need for the establishment of special fire patrols and a thorough cleaning up of the right-of-way. Also, the special instructions to regular employees relative to reporting and extinguishing fires, issued during the past two summers, by the management of the Intercolonial, should be repeated prior to April 1, 1915, and each spring thereafter.

A year ago, a resolution was adopted by the Commission urging that Government railways should be made subject to the Railway Commission, so far as fire protection is concerned. It has lately been learned that certain steps have been taken to comply with this suggestion.

**Railway  
Fire Hazard**

Railway companies throughout Canada are seriously handicapped in their efforts at fire protection by the presence of large quantities of inflammable *débris* on Crown and private lands immediately adjoining railway rights-of-way. The prevention of fires through the reduction of hazard is a most essential feature of any campaign for better fire protection. The efforts of the railways under the regulations of the Railway Commission can never be more than partly effective so long as the lands adjoining their property are allowed to constitute the worst kinds of fire traps. Further legislation, coupled with adequate enforcement, is necessary in order to provide satisfactorily for remedying this condition. While the situation as a whole is still in urgent need of attention, distinct progress has been made in some individual cases.

During the year, the provincial authorities of British Columbia have issued instructions requiring the burning of slash resulting from new public road construction and have also made provision for a beginning at cleaning up the old road slash, left from the work of previous years.

Although only a relatively small beginning has been made as yet, the situation should now improve from year to year. The reduction of fire hazard in this way will materially benefit the general situation, and will be of particular value in the numerous cases through the mountains where the public wagon roads parallel the railway lines closely.

In Ontario, provision seems to have been made for the satisfactory disposal of road slash on the very considerable amount of new construction, particularly in proximity to railway lines.

A particularly creditable piece of co-operation has been brought about between the Grand Trunk railway and the Department of Lands and Forests of Ontario, whereby an excellent beginning has been made in reducing the railway fire hazard through Algonquin park. This arrangement contemplates the careful and thorough disposal of inflammable *débris* on the Grand Trunk right-of-way and a strip of the Crown lands adjoining on both sides, through the park, the cost to be shared equally between the railway company and the Provincial Government. It is understood that this work will be continued next summer until the mileage through the park shall have been completed.

Another illustration, on a somewhat smaller scale, is the work done by the Department of Indian Affairs in disposing of old slashings along the Canadian Pacific line through the Shawanaga Indian reserve, in the Muskoka district of Ontario. This work has been most efficiently done, and practically eliminates the railway fire hazard, which previously was serious.

In these, and other individual cases, the railway companies have shown a thoroughly co-operative spirit, which has gone far in inducing land owners to do their share so as to meet the companies half way. The continuation and extension of such co-operation will, in the course of years, reduce the railway fire hazard very materially.

#### **Dominion Forest Reserves**

During the past year, material additions have been made to the area of Dominion Forest Reserves in Saskatchewan, but there are still large areas of non-agricultural forest lands in all the western provinces which should likewise be included in permanent forest reserves. At the present time, the total area of forest reserves and parks is as follows :

Manitoba.....	4,072.50	square miles
Saskatchewan.....	9,680.79	" "
Alberta.....	26,270.90	" "
British Columbia.....	3,777.56	" "
Total.....	43,801.75	" "

The net area of forest reserves alone is as follows :

Manitoba.....	4,072.50	square miles
Saskatchewan.....	9,680.79	" "
Alberta.....	19,473.15	" "
British Columbia.....	2,749.56	" "
Total.....	35,976.00	" "

Areas temporarily reserved with a view of being later included in permanent forest reserves are as follows :

Manitoba, approximately.....	700	square miles
Saskatchewan, " .....	3,200	" "
Alberta, " .....	14,000	" "
Total.....	17,900	" "

This does not include areas which were examined during 1914, the temporary reservation of which has not yet been approved. Action to approve the reservation of these areas should be taken without delay.

**Civil Service Reform** The merit system of appointments is not yet in effect in the field service of the Dominion Forestry Branch. All experience goes to show that a really efficient field service can not be developed under the patronage system of appointment, and it is believed that, in the interests of forestry, the adoption of the merit system should be brought about at the earliest possible moment. The Canadian Forestry Association have also urged this reform for years, and it has similarly been recommended by Sir George Murray in his report to the Dominion Government. It is believed that the Government should again be strongly urged to place the field force of the Dominion Forestry Branch in the Inside Service, and to provide for the filling of all places by competitive examinations. Many of the force as at present constituted are technically qualified, but many others are not, and provision should be made for appointing only qualified men. This is the most urgently needed reform at the present time. Similar action is necessary as to the forestry and fire-protective services of the several Provincial Governments.

**Forestry on Dominion Lands** We are still faced with the anomalous situation of a practically complete divorce between the theory and practice of forestry on Dominion Lands held under license to cut timber. This matter was discussed last year, on the basis of a report made for the Commission by J. H. White, of the Faculty of Forestry at Toronto. It was then shown that while the Forestry Branch is well equipped with men technically trained in forestry, and is administering the forest reserves, as well as affording fire-protection both within and outside these reserves, it has absolutely no connection, at the present time, with the administering of cutting regulations on the licensed timber berths, although many of these timber berths are included within the boundaries of the reserves. This is because the timber berths are not legally a portion of the forest reserves. At the same time, the Timber and



Grazing Branch, which is charged with the administration of the timber berths, has not, so far as known, even one man in its employ who has had any training in forestry.

As stated last year, the principal practical features of present-day forestry are: Such control of the methods of cutting as shall ensure the perpetuation of the forest, and such measures of brush disposal, as a fire-preventive measure, as may be found practicable and desirable under the conditions of each individual case. The licensed timber berths naturally include the bulk of accessible merchantable timber on Crown lands, and it is obviously illogical and thoroughly undesirable in every way to permit the cutting of this timber without the most careful and intelligent enforcement of the existing regulations, which have for their object the perpetuation of the forest. Such enforcement is, however, not now provided, and is impossible under existing conditions of organization.

#### **Forest Reserves in Ontario**

The present area of forest reserves and parks in Ontario is 22,574 square miles, or 14,447,360 acres.

This area, while large in itself, is not great in comparison with reserves and parks in Quebec; nor is it large in proportion to the total area of non-agricultural lands in Ontario which must always be chiefly valuable for the production of timber. There are many millions of acres of cut-over or burned-over Crown lands in this province, now practically without fire protection, which contain a great deal of young growth and timber at present below merchantable size, but which, if protected from fire, would ultimately become merchantable.

The present annual revenue from woods and forests in Ontario is in the neighbourhood of \$2,000,000. It is obvious that, if this revenue is to be maintained, new areas must be continually opened up for lumbering, and this, in turn, necessitates the protection of the non-merchantable areas and the young growth, in order that, when the time comes, they may contain merchantable timber ready for cutting. Any other policy means the sacrifice of a large future revenue, in order to avoid much smaller present expenditures. The problem is undoubtedly a difficult one, since the expense of protecting the large areas of young growth during the necessary period of many years would in the aggregate be heavy, while there is, at the same time, a strong demand for the surplus revenues for purposes of general governmental administration. It seems probable that the situation could best be met by the adoption of a definite policy which would result in the reservation and placing under protection each year of a limited but definite area of young forest

growth found upon examination to be most suitable for this purpose. An excellent step in this direction was the addition last year of 2,000 square miles to the Mississauga forest reserve, and 811 square miles to the Algonquin National park ; but this constitutes only the beginning of what should be adopted as a definite policy.

**Important Watersheds**      The necessity for further protection of important watersheds must also be considered. Water-power development is now a vital factor in the industrial life of the provinces, and this importance is bound to increase greatly in the future. For the preservation of this great interest, forest protection is absolutely essential. A concrete example of this relationship was brought to the attention of the Commission at the annual meeting a year ago, by Mr. Challies, Superintendent of the Dominion Water Power Branch. As a result of the representations made by Mr. Challies, a resolution was adopted by the Commission, favouring the establishment of a forest reserve on the upper waters of the Winnipeg river, and especially on the watershed of the lake of the Woods. So far as known, however, there has been no action upon this matter by the Ontario Government.

**Protection of Trent Watershed**      At the last two annual meetings of the Commission, there has been full discussion of the situation on the watershed of the Trent canal, and resolutions have been adopted and transmitted to the Ontario Government. So far as known, there has been no action taken, and the situation remains unchanged.

The land surface of this watershed comprises some 2,000 square miles, of which about one-third, or 725 square miles, still remains in the ownership of the Provincial Government. Of this, 450 square miles are still under license, while 275 square miles, or 176,000 acres, represent limits which have reverted to the Crown, after the licenses had lapsed or been abandoned. These Crown lands are practically all non-agricultural, and are chiefly valuable for forestry purposes.

It is understood that, on account of financial considerations, and the existence of very large areas of similar or better forest lands in the province, for which it is impracticable at the present time to provide adequate protection, there is little hope of the Provincial Government being able to provide the amount of protection urgently needed in the Trent watershed.

On the other hand, the Dominion Government is vitally interested in this situation, having already expended some ten million dollars upon works pertaining to the Trent canal. The protection of this watershed, and consequent regulation of waterflow, are essential

to the full success of this undertaking. It is believed that, under these circumstances, the Dominion Government would be amply justified in incurring further reasonable expense in order to protect the investment already made, as well as the future expenditures which must be incurred in completing the project.

In the Dominion Forestry Branch, there is already in existence an organization admirably equipped to carry on this work. The Dominion Government has already been authorized by the provincial authorities to acquire Crown land in the Trent watershed at fifty cents per acre.

The most practicable method of securing a beginning in the solution of this problem would be for the Dominion Government to proceed with the purchase of such portions of the 176,000 acres of unlicensed Crown lands as are fairly contiguous, and place the same under the Forestry Branch for protection and development ; or else, considering the benefits which such action would confer upon the province, it may be possible to induce the province to place such areas, free of charge, under the care of the Dominion Government. Undoubtedly, some plan of co-operation could be developed whereby a system of fire protection would be established, covering the more important portions of the watershed.

The cost of this work would not be great, in proportion to the benefits to be derived. In addition to the value of watershed protection, this work would have a very great indirect value as an experimental demonstration to all the Provincial Governments and owners of forest lands in eastern Canada, of what can be done in the way of restoring such waste lands to a productive condition. Educational work of this character is a thoroughly well-justified function of the Dominion Government, and is closely comparable to work which the Dominion Forestry Branch is already doing in the West, as well as to work in other lines which other departments of the Government are conducting throughout the Dominion. It is also directly parallel to work which the United States is carrying on in the eastern states, under the Weeks law, which carries a large appropriation for the acquisition of non-agricultural forest lands on the watersheds of navigable streams.

The work in the Trent watershed could be taken up on this basis by the Dominion Government, without any large expenditure, either for first cost or for annual charges. Also, entirely aside from the indirect benefits resulting from better watershed protection, the investment would in the long run undoubtedly be a paying one, from the sale of forest products in future years. In addition, these relatively barren lands would be made productive and would thus



add to the wealth of the country and afford an opportunity for labour on the part of the local population, which is able to find far too little remunerative employment under present conditions.

**Wider Use of  
Western Coal**

During past years, there has been some difficulty on account of excessive fire danger resulting from the use, as locomotive fuel, of certain western coals having poor coking qualities. This difficulty has interfered quite seriously with the use of some of these coals by railways during the summer season. In order to increase their summer market, the Canadian Coal & Coke Co. have employed an expert to devise a spark arrester which shall so check the emission of live sparks from the stack, as to permit the reasonably safe use of such coals the year round. The Grand Trunk Pacific railway and the Operating and Fire Inspection Departments of the Railway Commission are co-operating with the Canadian Coal & Coke Co. in the conduct of these experiments, which, unfortunately, are now delayed by the death of the expert and the necessity of securing a new man who is qualified to carry the experiment forward. The results already secured give considerable promise of success. Such an outcome is greatly to be desired, since the utilization of local coal supplies means the development of additional Canadian industries.

**Co-operative  
Fire Protection**

A notable occurrence of the past year in eastern Canada was the organization last spring of the Lower Ottawa Forest Protective Association. The territory protected by this Association comprises some 7,500,000 acres, on the watersheds of the Gatineau, Lievre, Rouge, Coulonge and Nation rivers, in the province of Quebec. The lines of organization are closely similar to those which had previously proved so successful in the case of the St. Maurice Forest Protective Association, the territory of which lies just east of the territory embraced within the Lower Ottawa Association. The combined territory of these two associations now comprises approximately 15,000,000 acres of forest lands. Both organizations co-operate closely with the Provincial Government of Quebec. In each case also, the Association manager is an officer of the Fire Inspection Department of the Railway Commission, and secures co-operation in that capacity from the railways operating within the Association boundaries. Co-operative fire protection having proven a success in a portion of Quebec, as it has previously proven in many portions of the United States, there is every reason to hope that the movement will continue, and in particular, that the plan at present under discussion of an association on the Upper Ottawa, shall be made effective.



**RIGHT-OF-WAY CLEARING ALONG GRAND TRUNK RAILWAY THROUGH ALGONQUIN PARK**

Note large amount of inflammable débris piled ready for burning at a safe time.  
The Ontario Government co-operated with the Company in this work.



**DOUGLAS FIR, COAST TYPE, NEAR VANCOUVER, B. C.**

Note large amount of inflammable débris remaining after logging. Broadcast burning in early spring or late autumn is being increasingly adopted in this type to reduce fire hazard.





**Game  
Preservation**

At the last two annual meetings of the Commission, resolutions have been adopted favouring the establishment of a game preserve in those portions of Alberta and British Columbia adjoining the Glacier National park of Montana. Through the extension of the Waterton Lakes park, this action has now been taken so far as the Alberta portion is concerned, but no action has been taken in British Columbia. The Provincial Government very naturally objects to the establishment of a park in that section, which embraces a portion of the headwaters of the Flathead river, on account of interference with the further development of the natural resources, particularly coal. It should, however, be emphasized that the Commission has recommended only the establishment of a game preserve, and that this action could readily be taken without the withdrawal of either land or minerals from alienation, and thus would not at all retard the development of the natural resources of the section in question. All that is needed is the enactment of a law by the provincial legislature or the passage of an Order-in-Council, closing an area of some 320 square miles to hunting, together with adequate provision for enforcement. Unless the Government of British Columbia can be persuaded to co-operate to this extent, it appears that there will be a serious limitation to the efficiency of the measures already taken by the United States Government in Glacier park, Montana, and by the Dominion Government in Waterton Lakes park, Alberta, looking toward the preservation of big game, particularly mountain sheep and mountain goats. This proposal has the cordial support of the Camp-Fire Club of America, which has continuously urged favourable action during the past several years.

**Scientific  
Investigations**

While fire-protection is the first essential to any plan of forest administration, it does not by any means constitute all there is to forestry, which is a well-developed science and profession in itself, even entirely aside from fire protection. The Dominion Forestry Branch, the British Columbia Forest Branch, and the Quebec Forest Service, all have quite extensive organizations, and have done excellent work, while the Ontario Government is doing less and has only the beginnings of a forestry organization. New Brunswick and Nova Scotia have no forestry organizations at all.

In closing my address I am reminded that, when I introduced the legislation which established the Forestry Branch of the Department of the Interior, I think in the year 1899, diligent enquiry elicited the fact that there was not one man in Canada who had any pretension whatever to a scientific training as a forester. Since

that time we have seen a very gratifying progress in this respect. We find that we have chairs of forestry in at least two provinces. We have a fine forest organization in connection with British Columbia, a very good organization in connection with the province of Quebec and the beginning of an organization in Ontario. In addition to this, as I have pointed out, we have succeeded in bringing about a very wide and effective organization over all privately-owned railways or Dominion chartered railways in the Dominion of Canada for the purpose of preventing forest fires starting in the vicinity of the railroad lines ; and our reports show that this system is becoming increasingly effective. On the whole, therefore, upon this important subject, I think we have reason to congratulate ourselves.

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#### SIR CLIFFORD SIFTON CONGRATULATED

DR. FRANK D. ADAMS : Mr. Chairman, ladies and gentlemen : Since the last meeting of the Commission of Conservation, an event has occurred which has been a source of great gratification to our members, namely, His Majesty has conferred upon our chairman the honour of knighthood. Many knights have been made in times past, and will be made in the future, for services in the open field, but others have been created knights for equally important services in the fields of peace ; and among this band of noble knights our chairman, Sir Clifford Sifton, now takes his place. I feel that this honour is, in a way, reflected upon the Commission over which Sir Clifford so ably presides, and I think it is appropriate for the Commission of Conservation at this time to express to Sir Clifford and to Lady Sifton, whom we have the pleasure of having with us to-day, our congratulations and our great pleasure at this very welcome action of His Majesty's. (Applause.)

SIR CLIFFORD SIFTON : Gentlemen, I thank Dr. Adams for the kind words which he has spoken, and I thank you for your kind applause in endorsing them. My friends have been altogether too kind to me in sending me their congratulations and in expressing the idea that I may have deserved something at the hands of the country for the efforts which I have made. I do not know whether that be true or not ; but you, my colleagues upon the Commission of Conservation, will at least give me the credit of being sufficiently persistent in endeavouring to force what I believe are the right views and policy upon those with whom I have the opportunity of doing a little missionary work. I hope we shall have the opportunity of advancing to something still farther along the lines which we have succeeded in following, to some extent, during the last few years.

# Work of the Ontario Association for the Promotion of Technical Education

BY

RHYS D. FAIRBAIRN

*President of the Ontario Association for the Promotion of  
Technical Education*

**D**URING the winter of 1914, a meeting was held in Toronto to consider the question of technical education. As a result, the Ontario Association for the Promotion of Technical Education was organized in April, and at the present time the following organizations are co-operating in this important work :

Trades and Labour Council  
Canadian Manufacturers' Association  
National Council of Women  
Clay-Workers' Association  
Ontario Educational Association  
Ontario Associated Boards of Trade  
Ontario Library Association  
Ontario Women's Institutes  
Ontario Association of Architects  
Toronto Board of Trade  
Toronto Advertising Club  
Local Council of Women of Toronto  
Advisory Committees, various Technical Schools

## **Objects of the Association**

It is the first time an Ontario organization has brought together so many influential associations with one object in common. This will in some measure explain how important the movement is, and the general interest which is taken in it by these various associations. What is required now, is the further education of the general public as to the advantages to Canada in providing technical education for the young people throughout the country.

As stated in the Constitution :

"The object of this Association shall be to bring to public attention the importance of industrial education as a factor in the industrial and educational development of Ontario, to provide opportunities for the study and discussion of the various phases of this problem, and to make available the results of experience in the field of industrial education."



We emphasize our object in the name of the Association—"Promotion of Technical Education"—and in using the word "Technical" we desire to imply its broadest meaning, which of course includes agriculture. It is always well to impress upon the people that agriculture and manufacturing must be developed simultaneously to make Canada not only a great, but an evenly balanced nation.

The present war has shown the disabilities of nations who are more or less depending on other nations for either food-stuffs or manufactured products. The more evenly balanced the production of a country is, the more independent that country will be. The first aim of every person in Canada, should be to maintain this country as one of the powerful, prosperous and happy nations within the British Empire, working for peace and good will among men.

The Ontario Government has made our work possible. The report by Dr. John Seath, Provincial Superintendent of Education, on "Education for Industrial Purposes," 1911, has given the lead to the whole province. It is a clear, practical outline of possibilities.

As a result of recent legislation, we have already in Ontario between 30 and 40 centres where industrial training is given. This is largely given in night classes, only six centres having day classes. The Minister of Education, Hon. Dr. Pyne, has by advice and personal attendance at our meetings encouraged the work very much.

**Progress in  
Other Provinces**

I speak more particularly of the province of Ontario because our association is a provincial one, but it is of interest to note that there is keen activity in all the provinces. The province of Nova Scotia was among the first to take practical steps to make provision for technical training in the schools. The province of Quebec, too, has been quite progressive and two large technical schools have been built by the Government, one in Montreal and one in Quebec. Manitoba has also done good work, there being two technical schools in Winnipeg. Alberta's new regulations come into force the first of February. Saskatchewan and British Columbia are also active. It is thus seen that the interest in technical education is general throughout the Dominion.

Our Association has already held two public conventions, where public men and prominent educationists have given addresses. This has resulted in the work being given great publicity through the press. Then we have undertaken a popular lecture campaign, which I will outline more fully later in my address. The first lecture under this plan was given in Pembroke during the present month by Dr. Putman of Ottawa. I had the pleasure of being present at this

meeting which was an undoubted success, and those interested are certain that it will be productive of good results.

Early last summer, the Association made representations to the Dominion Government for financial aid along similar lines to that already granted for agriculture by *The Agricultural Instruction Act*. Owing to the war this matter has been set aside for the present.

The Association's secretary, Mr. Thos. Bengough, has undertaken the publication of a journal under the name of "Training" which is devoted to problems of technical education. This is a business venture of his own, but it is used by the Association as its official organ.

#### Courses in Agriculture

We hope to urge for the introduction of a course in agriculture in our city and town high schools, to give an outlet from the city and town to the farm.

In the case of Ontario, our aim would be to have the courses so regulated that the high schools would prepare students definitely for advanced work at the Guelph Agricultural College. Further, we have found that in Ontario it is essential to the development of technical education to place manual training and domestic science as taught in the public schools under the "Advisory Industrial Committee." In this way the public school system may be brought to work in harmony with the technical schools.

In May, 1914, the Association's secretary addressed a large gathering of prominent men in Montreal with the hope of forming another similar organization in the province of Quebec. This so far has not been productive of results, and it is in the carrying forward of the educational work that we desire the assistance of the Conservation Commission.

#### Conservation and Education

The Conservation Commission has been investigating and working in connection with:

1. Agriculture—especially Illustration Farms and Neighbourhood Associations.
2. Forestry—Prevention of forest fires and the conservation of timber.
3. Fisheries—Notably oysters and whitefish.
4. Fur Farming.
5. Public Health—including Town Planning, etc.

At the annual meeting of the Commission in January, 1914, Sir Clifford Sifton said :

"Our duty is to investigate, enquire, advise, and inform. . . . . We should never carry the work (which might be considered depart-

mental) further than necessary to arouse interest in it, to point a way to improvement, and in some cases, to collect the information necessary to the formation of intelligent judgment. . . . .

"In the last resort, the highest degree of conservation depends upon the efficiency of the human unit. . . . . The greatest need of Canada to-day, from the standpoint of its material development, is a higher degree of agricultural and technical education. That we have not excelled in this respect in the past, except in certain branches, has been due to the fact that attention has not been directed to these subjects for a sufficiently great length of time to permit of the development of bodies of trained experts."

It is quite clear from these statements, that the Conservation Commission, by adding technical education to its active work for the next few years, would only be carrying out its own plan.

The Ontario Association for the Promotion of Technical Education aims merely to advance the cause of technical education, and does not infringe in any way upon the work of the Department of Education. Would it not be desirable to form similar organizations in the Maritime Provinces, Quebec, Manitoba, Saskatchewan, Alberta and British Columbia with the Conservation Commission as a central, guiding head? An annual expenditure of about \$5,000 would be necessary for organization work, and afterwards a considerably larger amount would be required to provide for lecturers to assist in carrying on the work in the several provinces. This would be entirely aside from the larger question of Federal aid to all the provinces for actual work being done.

**Need for  
Technical  
Education**

As to the need of an educational propaganda, there are probably 100,000 boys and girls in Canada of an age from 14 to 16 years who every year become engaged in occupations connected with the manufacturing, agricultural, mining, or transportation interests. The present general plan of education does not provide sufficiently for these young people. The apprentice system has passed, and technical education must take its place. The increasing cost of living makes it essential that these young men and women should have opportunities to prepare themselves for positions which would bring them larger incomes. Every manufacturer knows that it pays to engage trained workers at high wages or salaries, in preference to cheap unskilled labour.

Technical education, including training in agriculture, is essential to the future of Canada. It will require a large expenditure of money, but it is vital to the progress of the nation to have its young men and women properly trained for their life work. With the exception of the war, there is no other question before the people of Canada to-day of so great importance. If Canadian workmen had



the requisite training, many orders which now go to foreign manufacturers would be filled in Canada. Not only that, but such training would be a great advantage in the intelligent development of the country's vast natural resources. It is not so much a question of the lack of capital that handicaps Canadian manufacturers as it is of not having sufficient skilled help.

**Technical  
Education  
in Toronto**

The city of Toronto will open its new technical school in September, 1915. It will be one of the best of its type on the continent, and is well adapted to the requirements of the city. It is hoped that it will be used as a university by the residents of other towns. By this means it will be possible for students from different parts of the province to obtain technical instruction of the highest grade. The citizens of Toronto invested \$2,000,000 in the site, the building and its equipment ; nor are they satisfied with this, three sites for branch schools having already been purchased.

Special provision has been made for the training of girls as well as boys. All the branches of women's work are given careful consideration, particularly household science.

The fact is not forgotten that the health of the body is quite as important as the training of the mind. In the city of Toronto a plan to take care of children of weaker mentality is now being evolved. It is confidently expected that this will be a material assistance to the whole system of technical training.

Of the successful issue of the European war, we do not doubt, and following it, we will see just as great a development in Canada as we will be able to take care of. Trade conditions are much better to-day than they were last September, and they will continue to improve. Canadians should, therefore, with the least possible delay, prepare themselves to secure permanently this increasing volume of trade. To do this, technical education is a prime necessity. There is no reason why Canadian workmen, if provided with expert knowledge, should not become as proficient as any in the world, and so make it possible for Canadian producers to compete successfully with those from other nations who now have the benefit of the services of highly trained workmen. The Ontario Association for the Promotion of Technical Education, therefore, respectfully urges upon the Commission of Conservation the necessity of early consideration and prompt action in this very important matter.

**Promotion of  
Technical  
Education**

Before I conclude, I should like to outline briefly the plan that the Association has evolved for carrying out a lecturing campaign for technical education.

At a meeting of the Association held in Toronto in September, 1914, it was decided to commence an active campaign for the spread of information concerning technical education throughout the province. Such a lecture campaign was, therefore, planned, having the following objects :

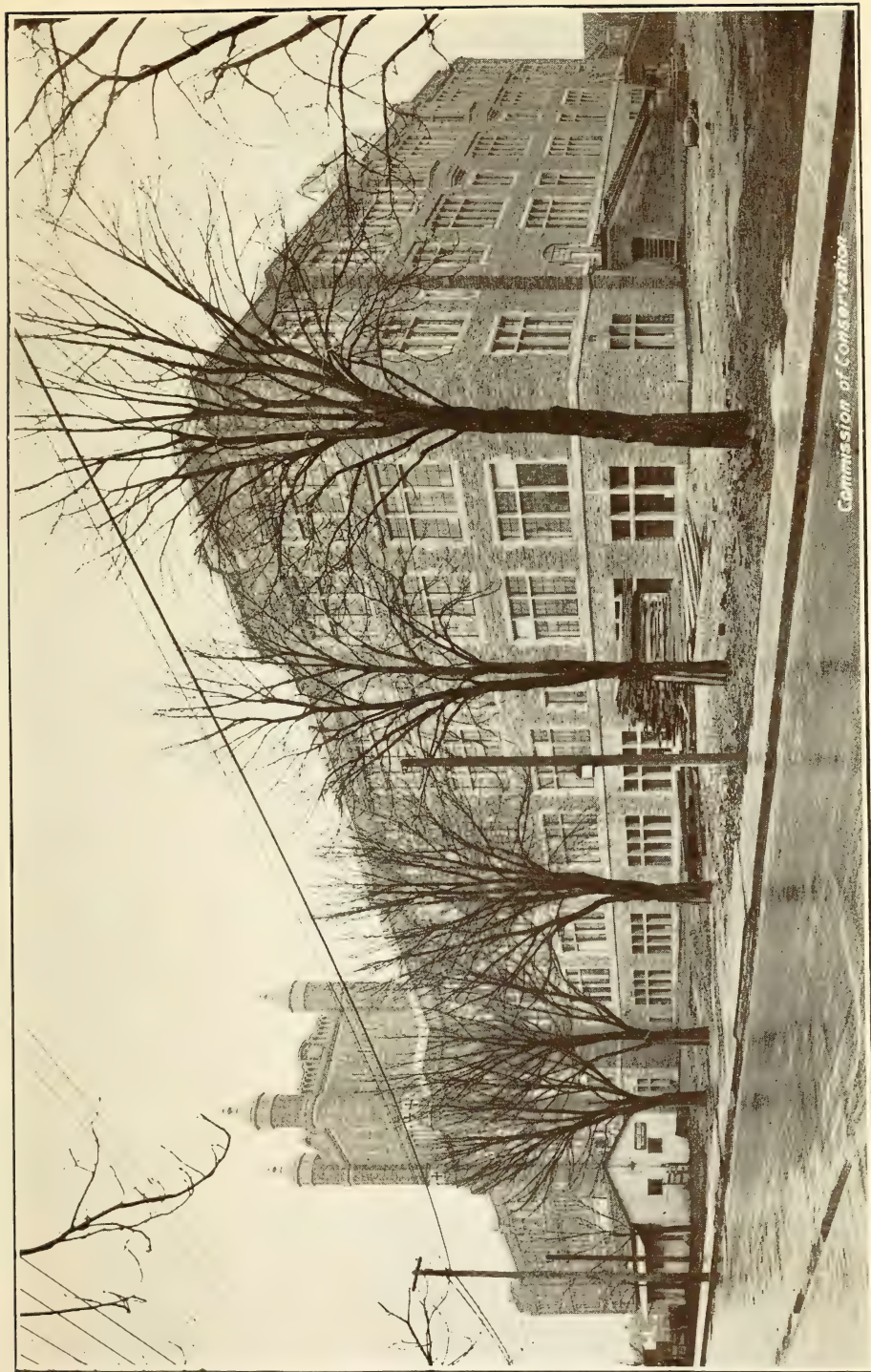
1. To inform and assist artisans and homemakers.
2. To encourage Canadians to form the habit of thinking along scientific lines.
3. To take advantage of popular sentiment in favour of buying goods "Made in Canada" and of "Capturing German Industries," and to mould this sentiment towards a popular demand for technical education.
4. To turn the current of public thought into practical methods for promoting industrial education, in line with the scheme of our organization, leaving the popular demand for technical education created by the lectures to be met by our governmental bodies.

It must be understood that the main object of the lectures is to arouse and mould public interest in favour of technical education and that these efforts are intended to supplement and make more effective and not to supplant those of governmental and municipal bodies and officials.

Many leading men have volunteered to assist in this lecture campaign, so that the Association has been able to provide lecturers in any centre in Ontario free of any cost other than that involved in entertaining the lecturer and in advertising the meetings. In addition to this, when a local Branch of the provincial Association is formed, a nominal fee is levied to cover actual running expenses. These local Branches must have at least ten members who pay an annual fee of \$1.00 each for membership in the Association. The Association endeavours to work through the mayor and leading citizens of every town and city in the province. To this end circulars are sent out explaining fully and in detail the work that is being undertaken and the manner in which it is proposed to accomplish it.

By means of this lecture propaganda it is expected that the widespread sentiment in favour of better training for Canadian artisans, apprentices, school boys and girls, farmers and citizens generally may be made effective. It is also hoped that by this means the evils resulting from the European conflict may be minimized. This can be done by our people turning their attention





TECHNICAL SCHOOL, TORONTO, ONT.

The building, exclusive of site and equipment, cost \$1,400,000. It has seven acres of floor space and will accommodate 2,500 day pupils. It will be formally opened in September, 1915.





to constructive lines of effort, and through the application of such knowledge of industrial training and of agricultural development as they can acquire, improving local conditions and increasing the prosperity of the province.

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SIR CLIFFORD SIFTON : I am very pleased that we have been able to get Mr. Fairbairn to come and give us this account of what has been done for technical education in the province of Ontario. I imagine that we do not thoroughly appreciate what the province of Ontario, and especially the city of Toronto, is doing for this important subject. As a matter of fact the city of Toronto is doing more than any other place or institution in Canada. They have taken hold of the matter in a very broad and liberal way. I want to say that personally I do not share the profound admiration for the lower grades of the Canadian educational system that it has been customary to express as long as I can remember. I have a very profound belief that, in the province of Ontario, the educational system, which has been followed pretty well by all the other provinces except Quebec, has been busily engaged in educating the people away from the work which they ought to be doing. I do not hold with the idea of establishing grammar schools and collegiate institutes to teach boys to make critical examinations of Shakespeare's plays and Milton's poems, when they know nothing about agricultural chemistry and have not the faintest idea of mechanics or other branches of technical education. As soon as these boys get through with their school course they are obliged to look all over the world for some place where they can get a job to apply the education they have received. We have been doing that for two generations and the result is that many of our boys are all over the world except in Ontario, while we have natural resources here, illimitable in extent, requiring capacity and technical education to develop them. Further, Ontario is not producing one-half of what it could in agricultural products if that industry had had the intelligent attention of the men we have been educating and sending all over the world to work for other people. I regard this development which Mr. Fairbairn has indicated as one of the most valuable things that can be imagined and I am glad to see that we are getting back in Ontario to the place where we ought to have started about forty years ago, and I hope it will be followed in the other provinces.

## The Utilization of Some of Our Non-Metallic Mineral Resources, Suggested by Present Conditions

BY

EUGENE HAANEL, Ph.D.

*Director, Mines Branch, Department of Mines, Ottawa*

THE disturbed industrial conditions throughout the civilized world, which the present great war has created, have brought into prominence the fact that we have been, and are, dependent upon other countries for materials—raw or manufactured—which enter into our own manufactures, or which are necessary for our very existence.

The great question which, therefore, forces itself upon us is : Can we, in a measure, turn this calamitous dislocation of trade and commerce into what will ultimately lead to the expansion of our own industries, or, possibly, develop new ones, and render us, to a larger extent, independent of outside sources for the materials required for our needs ? Necessity is a great stimulant, and there is no question but that this rugged, vigorous, northern nation, inhabiting this country of great resources and promise, will respond to the stimulus and emerge from this present condition of distress more vigorous, more self-reliant, and more prosperous than ever. This, however, can not be accomplished without some sacrifices. It will, if we desire to establish new industries, be necessary to be satisfied with modest profits, and we require to remember that some of the greatest industries of the world have been created and put upon a solid foundation only after many years of laborious efforts, after many discouragements, and much expenditure of money. Under present conditions we need captains of industry as much as captains for our soldiers, who bring into evidence their patriotism, the one, by tiding over the present distressful condition ; the other, by defending the country against aggression.

I desire to confine myself in this paper to the discussion of those few non-metallic minerals which have hitherto been imported in large quantities, and represent an outgo of large sums of money, to point out to what extent it may be possible for us to substitute those of our own resources, and to give some hints regarding the lines into which we might direct our activities.



# CONSUMPTION OF COAL AND COKE

The imports of coal for the year 1912 were :

Anthracite.....	4 million tons
Bituminous.....	10½ “ “

The latter increased to 13½ million tons for the year 1913, and the total imports to 18 millions of tons in that year.

The imports of coke are represented for the years 1912 and 1913, respectively, by 628,000 and 723,000 tons.

Practically all of the anthracite coal is imported for domestic purposes.

I have, in a previous paper delivered before this Commission, outlined how we could, to a considerable extent, decrease this very large importation of fuel by utilizing the fuel of our extensive and excellent peat bogs.

## Peat, a Substitute for Coal

The improved plant for the manufacture of peat fuel, erected at Alfred, Ont., by a private company employing the process demonstrated by the Mines

Branch is, perhaps, the most complete and effective yet constructed. The war has stopped its operation. I need here to state, that in the event of again starting operations at Alfred next spring, the operators must bear in mind that such an industry can only succeed under most careful business management, and can only expect to pay a small but reasonable profit. Three years ago, Russia produced two million metric tons of peat fuel, and, for the last two years, this amount was increased to a production of seven million tons per annum. The process employed is identical with that demonstrated by the Mines Branch and carried out with improved machinery at Alfred. Peat fuel is manufactured by thirty-seven firms in central Russia ; thirty-six of these firms are manufacturers of woollen and cotton goods and glass, and manufacture their own fuel, and only one firm manufactures peat for sale. This statement goes far to prove that, if properly managed, the peat fuel industry could be put on a sound financial basis in Canada.

The conversion of peat fuel into an industrial gas appears, however, to be the most feasible and attractive method for the conversion of the latent heat energy of our peat bogs into useful heat energy.

Certain of the peat bogs examined in the province of Ontario contain very large percentages of nitrogen—up to 2.6 per cent—and this can be recovered as ammonia or ammonium sulphate by means of by-product recovery producers. This ammonium sulphate is one of the most valuable fertilizers and the demand for it previous

to the war exceeded the production. A ready market is, therefore, always available.

**By-Products  
from Peat**

So important did this subject appear to me that a Commission, consisting of the Chief Engineer of the Fuel Testing Division and his assistant, was sent to Europe to investigate there in detail the peat industry, with special reference to the utilization of this fuel in by-product recovery producers. The report embodying the results of this investigation is now in the press, and it is there shown that certain of the Canadian peat bogs can be profitably utilized for the production of industrial gas, at a cost far below that possible for town gas. In that report it is further pointed out that such a gas distributed to surrounding towns and villages would do much toward relieving the fuel situation in places favourably situated for the introduction of this method of obtaining power and heat for domestic purposes.

I have received the following letter of enquiry from R. B. Prickett & Co., Trafalgar Buildings, 1 Charing Cross, London, Eng., dated April 22nd, 1914 :

"We are writing to enquire whether the output of the Government plant at Alfred is now sufficient to enable you to make a contract to deliver at Alfred say 250 tons of peat per day or say a yearly quantity of 75,000 tons. If you cannot deliver this quantity, what is the largest tonnage of peat you can contract to sell and at what price per ton (state short or long) will you deliver it at Alfred, Ontario? Can you sell absolutely dry peat or would you prefer to sell peat with 25 per cent of moisture, and when could you begin delivery on such a contract?"

"If we can arrange with you for the supply of peat from the Alfred bog, we intend to put up a plant at Alfred to treat this peat for the recovery of by-products."

This goes far to show that the treatment of peat for the recovery of by-products alone is considered a sound business enterprise.

**Use of Lignites  
and Bituminous  
Coal**

The large quantity of bituminous coal imported into Canada is due to the fact that our own supplies, though extensive and capable of supplying the needs of the country, are situated in the far east and west, and the extra cost entailed by the long haulages from producer to consumer renders its utilization in the central provinces at present impracticable.

It may, however, be possible, in the near future, to decrease the annual importation of bituminous coal, by utilizing the Western lignites for those purposes for which bituminous coal now appears indispensable. The principal, and perhaps the main purpose for which bituminous coal is used in the West is for railway locomotives and power plants.

# Lignites as Gas Producers

A few years ago the Mines Branch erected and equipped a fuel testing station for the investigation, on a commercial scale, of the various fuels found in Canada. Up to the present time, several 25-ton samples of lignites—obtained principally from the province of Alberta—have been investigated to determine their value as fuels for the production of power-gas and for steam raising, and it has been found that, in almost every case, they have proved most excellent fuels for the production of power-gas in the gas producer.

Certain of the Western lignites, and this also applies to certain bituminous coals, contain a sufficiently high percentage of nitrogen to make their utilization in the by-product recovery producer a profitable venture. The gas could be used either for power, industrial or domestic purposes, and could be sold per 1,000 heat units at a price far below that possible with retort gas made from ordinary gas coal. This gas could be distributed from the plant, preferably placed at the lignite mine, to the homes, offices and factories, of such a city, for example, as Edmonton. That such a method of using fuel economically is feasible and profitable is evident from the fact that this method of distributing gas, generated as described, over an industrial area of large extent for power and other purposes is in actual operation in Staffordshire, England.

The further problem of adapting the Western lignites by some preliminary treatment and briquetting for use in locomotives and for domestic use is at present occupying the attention of our fuel-engineers.

# Tar, an Important By-Product

Tar obtained from the coking and retorting of bituminous coal is of special interest, since on this material—not many years ago regarded as a waste product—has been founded one of the largest and most profitable industries in Germany: the manufacture of aniline dyes. While it is conceded that it would be unwise, at the present time, to establish such an industry in all its ramifications on this continent, Canada requires for its own use and can produce certain distillation products of tar which we now require to import in large quantities, as the following figures will show :

Canada imported during the twelve months  
ending March, 1914 :

Crude coal and pine tar. . . . .	2,600,000 gallons
Coal and pine pitch. . . . .	1,400,000 “
Carbolic or heavy oil. . . . .	1,022,000 “
Asphalt, . . . . .	107,000,000 lbs.



The United States consumed in 1913, for timber preservation over 90,000,000 imperial gallons of creosote, and, *of this quantity, 62 per cent was imported from Europe.* Between 60 and 70 per cent of the total quantity consumed was used for the treatment of railway ties. The annual consumption of railway ties in Canada is 19 millions, and, of these, ten per cent are creosoted.

Approximately, 60 per cent, or 950,000, of these creosoted ties are imported from the United States, and the balance are creosoted in Canada. The quantity of creosote oil required to thoroughly creosote a railroad tie is said to be about three gallons. Approximately, 5,700,000 gallons of creosote oil would, therefore, be required to creosote these two million railroad ties alone. The total quantity of tar reported to be produced from by-product coke ovens and gas works in Canada is approximately eight million gallons from coke ovens, and four million gallons from gas works. This latter figure is merely an estimate, definite information not being available.

If all this tar, 12 million gallons, were distilled for the recovery of creosote oil alone, under the most favourable conditions, the yield would be 4,800,000 gallons. In practice, however, such conditions do not obtain, since the tar is distilled for other products, in addition to creosote oil. The yield of creosote oil would, therefore, be considerably less than 4,800,000 gallons. From the above figures it will be seen that, if all the tar produced in Canada were worked up into its various oils and other by-products, it would be insufficient to meet the demand of the home market, and, with an increased consumption of ties by railroad companies, which is almost certain to ensue, a greatly extended market for creosote oil will be provided.

It is, therefore, of the utmost importance that all retorting in coke ovens or in town gas retorts be conducted in by-product ovens for the recovery of tar, and that distilleries be established at strategic points for the distillation products of tar, for which a steady market would be assured.

#### PETROLEUM AND ITS DERIVATIVES

Petroleum in the crude state, and its refined derivatives, were imported into Canada in the following quantities for the twelve months ending March, 1914 :

Gasolene.....	27,451,379 gallons
Petroleum (crude fuel and gas oils, sp. gr., 0.8235).....	177,879,835 "
Petroleum (crude gas oils other than naphtha, benzine, and gasolene lighter than the former, but not less than 0.775 sp. gr.)..	45,853 "

Coal oil and kerosene (about).....	19,300,000 gallons
Illuminating oils, derived wholly or in part from petroleum.....	168,290 "
Lubricating oils costing less than 25c. per gallon.....	5,157,804 "
Lubricating oils, N.O.P.....	1,112,583 "
Petroleum products, N.O.P.....	5,166,274 "

The large quantity of petroleum represented by these figures is almost wholly imported from the United States, Great Britain contributing but little toward our import trade of this important material.

The total domestic production of petroleum for the two years 1912 and 1913 was 8,516,762 and 7,982,798 gallons, respectively.

The oil-fields of Ontario practically supplied the whole of this quantity of petroleum, and while, in the past, this field has been an extensive producer, its output has been falling off during the last five years, instead of increasing as the requirements of the market would demand.

#### Discovering New Sources of Oil

The great need of discovering new sources of supply of petroleum to meet this ever-increasing demand led to the employment by the Mines Branch of Mr.

Clapp, one of the ablest petroleum experts of the United States, to make an investigation of the oil and gas resources of the Dominion, with special reference to the geological indications of the existence of oil in the province of Alberta. The report of this investigation is now in the press and, according to the opinion of Dr. Day, petroleum expert of the United States Geological Survey, who read and aided in the assembling of the manuscript and extending certain portions of it, no such complete report on this subject has hitherto appeared on this continent.

While the indications of the existence of petroleum in Alberta are promising, no large producing oil wells have as yet been developed. We have, however, in the extensive and rich oil-shale deposits of New Brunswick a source of oil which, if exploited, would substitute large quantities of petroleum and its derivatives, now annually imported.

The distillation of oil-shales in Scotland has been for many years, and is to-day, a successful and flourishing industry. Our shales are, on the average, richer than the Scotch shales, and no argument can be presented against the establishment of a similar industry in Canada. So important are these deposits and so great the need of decreasing the large amount of petroleum imports, that the Government, to encourage the exploitation of these deposits, has amended

the Petroleum Bounty Act, and has provided for a bounty of  $1\frac{1}{2}$  cents per gallon, or  $52\frac{1}{2}$  cents per barrel containing 35 imperial gallons, on oil recovered from oil-shales.

It is quite possible, also, that the lignite deposits of the West might, upon retorting, prove an additional source of oil. The lignites of Germany, it is reported, are at present being utilized in this manner. It should be borne in mind that the recovery of oil from the oil-shales and lignites is accompanied by the production of ammonia recovered as ammonium sulphate, for which there is always a ready market.

### PROGRESS OF CERAMIC INDUSTRIES

In the great expansion and development of commercial activities, so apparent in the Dominion of Canada prior to the war, and which must, after its cessation, be even more vigorously prosecuted, the subject of ceramics is necessarily of great importance.

The commercial value of clay products in Canada may be estimated from the following figures, collected through the statistical division of the Mines Branch. The clay products mentioned were manufactured in Canada during the years 1912 and 1913:

	Production in 1912	Production in 1913
Brick, common.....	\$ 7,010,375	\$5,917,373
pressed.....	1,609,854	1,458,733
paving.....	85,989	75,669
ornamental.....	8,595	15,423
Fire-clay and fire-clay products. . .	125,585	142,738
Fire-proofing.....	448,853	461,387
Pottery.....	43,955	53,533
Sewer pipe.....	884,641	1,035,906
Tiles.....	357,862	338,552
Kaolin.....	160	5,000
Total value.....	\$10,575,869	\$9,504,314

During the year 1905, the importation of clay products amounted in value to \$2,501,206, and it has increased to \$6,760,762 for the year 1913, equal to nearly 170 per cent. For the year 1912 we utilized clay products valued at \$17,149,659, yet the returns show that we imported 38 per cent of these products. This simple statement shows that in 1913 we sent out of Canada for these products alone \$6,760,000, which, if it had been held in our own country, would have meant the investment of a large amount of capital, and would have given employment to a large number of men.

**Exploitation of Canadian Clays** It must not be concluded from this statement that this very large importation, which is constantly increasing, is due to lack of raw materials at home. Reports on the location and character of the clay deposits of Mani-



toba, Saskatchewan, Alberta, Quebec, and Nova Scotia have been issued by the Geological Survey. New deposits are constantly being discovered and specimens are being sent to our laboratories, with the request that we state what use can be made of the deposit. To merely send the owner of the deposit a chemical analysis of his clay does not answer his query, since chemical analysis is only a preliminary, though necessary, step in ascertaining the fitness or unfitness of a clay for any special clay product. Before a sound opinion can be arrived at, as to whether a specimen of clay is the proper material for the manufacture of tiles, bricks, terra cotta, sewer pipe, or other clay products, the specimen requires to be submitted to a physical examination regarding the character of the product as it comes from the muffle. It is during this investigation that the problem, in many cases, admits of solution, of how a clay otherwise unfit may, by special treatment, be rendered suitable for the manufacture of a commercial product. To enable the Mines Branch to furnish this complete information regarding clays submitted by prospective operators of clay deposits, provision has been made for the establishment of a ceramic division in the Mines Branch, with a properly trained and experienced ceramic engineer in charge. The completion and equipment of the ceramic laboratory begun last year, is under way. Through the activities of this division, intelligent assistance will be given to the manufacturers of clay products, and it is expected that this course will lead materially to decrease the large imports of clay products into Canada.

#### BITUMINOUS SANDS OF ALBERTA

The existence of deposits of bituminous sands in the McMurray district of Northern Alberta has been known for many years. The absence of transportation facilities has, however, prevented the utilization and even the prospecting of these deposits.

Anticipating the building of the Alberta and Great Waterways railway into Northern Alberta, a preliminary examination of the deposits was undertaken by the Mines Branch in 1913 and continued in 1914. Meanwhile, the construction of the railway, which will open up and render available these deposits, is being rushed, and its completion is expected in 1916.

The investigation made revealed the fact that the tonnage of bituminous sands in the McMurray area is very large, and, although much of the material is low grade and, in some cases, the overburden so heavy that mining by open-cut is impracticable, it is found that some 20 per cent of the material, representing many millions of tons, may be considered as of commercial value.

Bituminous sands have for a number of years been used in the construction of various classes of pavements in the United States. The principal sources of supply, at the present time, are in Kentucky, Oklahoma, and California. The extent to which the material has been used appears to have been largely determined by the fixing of freight rates. The greater part of the bituminous sand used at the present time in California for paving purposes comes from the Santa Cruz quarries, and is, in many respects, similar to the Alberta material. The bitumen contained in the McMurray rock is, however, much softer. It is believed that, with proper manipulation, such as heating, and the addition of a hardening flux, the penetration of the bitumen can be reduced to meet the requirements of standard specifications for its successful employment in the laying of pavements in substitution for imported asphalt.

<b>Use of Tar Sands in United States</b>	Before the Mines Branch felt justified in making any recommendation regarding the utilization of the tar sands of Alberta for road construction, it was important to ascertain the success or failure which attended attempts in this direction in the United States. Enquiries were, therefore, sent to a number of municipal engineers, who have had actual experience with this class of rock in California. The following are the answers received :
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Mr. Walter M. Frickstad, Assistant Superintendent of Streets, Oakland, Cal., wrote, in part, as follows :

"The sandstone used in Oakland is all from the Santa Cruz quarry.....Since 1911, we have used this material in the construction of about one and one-half miles of street with uniformly satisfactory results.....The first street constructed with this material in Oakland was built about twenty-two years ago, and is in excellent condition to-day. This street has had a steady stream of light traffic, but is not a portion of a thoroughfare. Another street laid in 1898 has carried a reasonably heavy traffic from the time of its construction, and is now one of our main business streets. The pavement of this street had no repairs until last year, when about 2½ per cent of the surface was renewed. Additional repairs are now being made to about the same amount....."

Mr. Eldon A. Garland, City Engineer of Santa Barbara, Cal., wrote as follows :

"In answer to your communication relative to the bituminous deposits in the vicinity of Santa Barbara, would say that in my opinion an excellent pavement can be made from this material if it is properly treated.....In short, I would say that, from my observation and experience, I believe, with proper treatment, as good a pavement can be made with the material from natural deposits of

bituminous lime rock or sandstone as can be laid with the use of refined asphalt."

Mr. M. M. O'Shaughnessy, City Engineer, San Francisco, Cal., wrote as follows :

"In reply to your letter of Jan. 4, 1914, regarding bituminous rock pavements laid in San Francisco, will say that I find them very satisfactory. We have some streets of this material that have been down many years which are still in an excellent condition....."

**Bitumen for Building Roads** In view of the fact that the bitumen contained in the tar sands of Alberta is softer than the bitumen of the California material, arrangements have been made by the Mines Branch for the laying of an experimental pavement in the city of Edmonton with the Alberta material, the city government having agreed to construct the concrete foundation. Upward of 60 tons of suitable material has been assembled in the McMurray district for transportation to Edmonton, and it is expected that work will be begun in the laying of the pavement early this summer.

The City Commissioner stated in his letter to the Department offering the co-operation of the city,

"that if this work is successfully carried out it will be of greater value to the city of Edmonton and Alberta generally than the bringing in of half a dozen industries. At the present time," he goes on to say, "we are absolutely suffering from the lack of cheap pavement and from the lack of good road-material, whereby the farmers may haul their products to the city on well built roads. The solution of this problem will be worth millions of dollars...."

At the present time, all asphaltic paving materials used in Canada are imported from foreign countries. In 1913-14 the value of these imports reached a total of nearly \$900,000, and the consumption is rapidly increasing. The value of a cheap and satisfactory paving material in Western Canada would be very great.

**Uses for Tar Sands** The bituminous sands may also serve as a source of pure bitumen, which may be extracted either by disulphide of carbon, the lighter petroleum distillates, or by the use of hot water and steam. Among the many uses to which this extracted bitumen may be applied may be mentioned : floorings for many classes of buildings, such as mills, hospitals, schools, skating rinks ; for foundations which require to absorb vibrations and jars, as in electric power plants ; for lining and damp courses for cellars, reservoirs, etc. ; for insulation of pipes ; and as a source of asphaltic oils.



Attempts in this direction have been made for the past twenty years in the United States. No industry, however, has been established and no extracting plant is now in operation. The cause for the failures is not far to seek. In California extracted bitumen, at \$12.00 per ton, can not compete with petroleum residuum at \$6.50 to \$9.00 per ton. In Alberta, however, bitumen extracted at \$12.00 could compete with imported refined asphalt, costing \$27.00 to \$34.00 per ton, delivered.

Before such an industry, however, is attempted, all available information of the results of many years' serious and often costly experimentation in the United States should be consulted.

#### FELDSPAR AS A POSSIBLE SOURCE OF POTASH

The extensive potash deposits near Stassfurt and Magdeburg have enabled Germany to control the world's market of this important material, which enters into the composition of fertilizers, soap, glass, matches, colours, and is extensively employed in the photographic and chemical industries. In 1913, the United States imported some fifteen million dollars' worth of potash salts, 85 per cent of which was used in the fertilizer industry. Canada imported, in 1910, potash salts to the value of \$267,214, besides cyanide of potassium and of sodium for metallurgical purposes, valued at \$62,410. The importation of potash salts during the fiscal year ending March 31, 1914, was valued at \$524,514, and of cyanide of potassium and of sodium at \$243,907, showing a very large increase in the consumption of these salts.

Many attempts have been made to break this monopoly by devising a process for the economic extraction of the potash contained in feldspar—a mineral of wide distribution. As applications have frequently been made to the Mines Branch for information regarding the feasibility of utilizing our extensive feldspar deposits for the extraction of the contained potash, I take this opportunity to describe the most recent and, in my opinion, the simplest process which has, so far, been devised. The inventors, Alerton S. Cushman and Geo. W. Coggeshall, at the recent meeting of the American Institute of Chemical Engineers delivered a paper in which they considered in detail the cost of production of potash from feldspar by their process. The costs are based upon the results of practical mill-runs made on a large scale by the authors. The process employed may be briefly described as follows :

<b>Extraction of Potash from Feldspar</b>	A mixture of finely-ground feldspar, containing about 10 per cent of potash and burned limestone, is formed into rounded aggregates, termed "clumps," about $\frac{1}{4}$ inch in diameter, by being sprayed with an 80 per cent
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solution of calcium chloride. The clumps so produced are transferred directly into a rotary kiln, heated either by oil or powdered coal flame. During the passage of the clumps through the furnace, the reaction takes place which converts the insoluble potassium silicate into the soluble potassium chloride. The red hot clumps, as they come from the furnace, fall directly into water, contained in leaching vats, which dissolves the chloride of potash formed. The remainder of the process consists in recovering the solid chloride of potash from the concentrated solution.

The authors recommend a plant large enough to handle 300 tons of feldspar per day of 24 hours, producing 47.54 tons of 80 per cent potassium chloride.

The cost of this product comes to \$31.32 per ton. The price quoted before the war in the United States for the same article, of German origin, was \$37.50 per ton. This is over \$6.00 higher than the calculated cost of the article manufactured by the Cushman-Coggeshall process. According to their cost sheet, this \$6.00 represents a profit of 20 per cent on the manufacturing costs of potash from feldspar. For the figures in detail on which this cost of manufacture is based, I must refer you to the inventors' paper.

Assuming that cost of plant, overhead and operating charges would be the same in Canada as stated in their paper, the cost of the raw materials would be determined by the cost at which they can be assembled at the locality selected for the proposed plant in Canada. The prices quoted per ton of the raw materials entering into the calculation of costs of product given by the authors are : Coal, \$2.50 ; feldspar, \$1.00 ; burnt lime, \$2.33, and calcium chloride, \$7.33. The latter is a by-product of the ammonia-soda-alkali process, and would require to be imported from the United States at a considerably higher figure than that given.

#### Prices of Potash in America

During the last week of November, 1914, chloride of potash was quoted at \$100.00 per ton in the United States, an advance of 266 per cent on the price before the war. How long such, or even higher, prices will prevail depends upon the length of the war and how soon the potash deposits of Germany can again be drawn upon to supply the market. It is stated that the cost of mining the potash deposits permits the product to be sold profitably at one-third the cost charged to customers in the United States before the war. It is evident, therefore, that, when commercial relations are once more adjusted, the proprietors of the potash deposits, whoever they may then be, could undersell any manufacturer of potash from feldspar, and this would mean the

scrapping of the plants which had been erected, if they could not then be used for other purposes.

#### SOURCES OF SULPHUR USED IN CANADA

The only domestic sources of sulphur are its ores, pyrites and pyrrhotite. The sulphur in our native ores does not occur in a form which makes it available for many purposes. We require, therefore, to import elemental sulphur to satisfy our needs. These imports reached, in 1913, 36,300 tons, which, for customs purposes, were valued at \$20.00 per ton. I have pointed out, in a previous address to this Commission, that, hitherto, we have not been able to conserve the truly enormous quantities of sulphur which, in the form of sulphur dioxide, result from the roasting of our sulphurous ores. The discovery of a process, therefore, which would permit the economic recovery of the sulphur from the waste sulphurous gases of roasting furnaces would be of immense value. Such a process has recently been invented by William Hall of New York. It was primarily designed for the purpose of preventing noxious fumes of sulphur from smelting operations contaminating the atmosphere. The commercial development of this process is under way. In experiments on a commercial scale that have already been made, the principal difficulty appears to have been the collecting of the elemental sulphur produced, because it was produced in such quantities that the washer provided was unable to remove it, and the pipes became clogged. This is a mechanical difficulty, which proper design will overcome.

It is estimated that elemental crude sulphur can be produced by this process for about \$5.00 per ton. For certain purposes it may require refining, which would increase the cost of the final product to about \$9.00 per ton. Contrast this with \$20.00 per ton, which we require to pay for imported sulphur.

As Mr. Wierum, who conducted on a commercial scale the experiments made with the Hall process, is to read a paper on this subject at the ensuing meeting of the Canadian Mining Institute, I refer you for details of the process and probable cost of production to his paper.

#### **Sulphur from Nickel Ores**

Experiments are at present under way by the Mond Nickel Co., Ltd., at their Coniston, Ontario, plant, in trying out the Fink smelting furnace for the treatment of their copper-nickel ores, with which an 80 per cent matte is expected to be produced from raw ore fed to the furnace, thus eliminating heap-roasting, sintering, and separate converter operations hitherto required.



It was suggested by the President of the Fink Smelter Company that the Department of Mines send a representative to Coniston to witness the run. To a telegram addressed to Mr. Corless, Manager, asking for permission to witness and report upon the test-runs made with the furnace, we received reply that, at present, Mr. Corless was not in a position to grant our request. It is hoped that opportunity may be afforded to the Department at a later date to witness and report upon a test-run made with this furnace. If successful in treating raw ore for the production of an 80 per cent matte, by a single operation, and the Hall process can be applied to the recovery of sulphur from the gases issuing from the furnace, an immense step forward in the treatment of the Sudbury ores will have been made, and the sulphur dioxide troubles will not alone have been effectively overcome, but elemental sulphur will be produced as a by-product, which will find a ready market, and Canada, instead of importing this material, will probably be in a position to export it.

#### GENERAL ASPECTS OF WORK OF MINES BRANCH

Permit me now to make some general statements regarding the efforts which have been made by the Mines Branch to render effective service to the mining industry.

**Reports for Manufacturers** Shortly after the organization of the Department of Mines, it was found desirable, and in the interests of the mining industry, to make an investigation into the requirements of Canadian manufacturers for such minerals as they employ as raw materials, or indirectly, as a means of producing the finished articles of their factories.

To obtain this information, the manufacturers throughout the Dominion were called upon, and as full details as possible were obtained from them regarding the minerals used by them, the quantity of each consumed per annum, the source of supply, and the price, delivered at their factories. Special attention, in this enquiry, was directed to the physical and chemical properties which should be specified in purchasing the various minerals for each of their uses.

The report on this investigation, entitled "Non-Metallic Minerals Used in the Canadian Manufacturing Industries," is now in press, and will be ready for distribution early this year. It contains not only tables giving the yearly consumption of each mineral by each class of industry, and the source of supply, but includes descriptive articles on each mineral, its uses, the methods of preparation for the market, and notes on the physical and chemical properties which fit, or unfit, it for the several uses. There are two

appendices, the first giving a list of Canadian manufacturing firms which are consumers of minerals, classified according to industries ; and the second, a list of producers of the non-metallic minerals.

The figures obtained during the investigation reveal the fact that an unduly large proportion of the minerals used is of foreign origin. In a number of cases the importation is necessary or advisable, since some minerals and particular grades of others are not obtainable at present in Canada, or the material may be procured from abroad for less than the cost of production and delivery of the Canadian. In some other cases, however, it is due to the fact that the domestic products are not always prepared in the form most suitable for the purposes for which they are required. Thus, for example, the want of proper grading of the mica by the small miners of this material in Canada, has done much to replace the Canadian mica by the properly graded mica of India, every consignment of which is uniform in quality.

In some instances, certain minerals were imported, which were produced in the country, of excellent quality, and often quite near at hand. Binoxide of manganese, for example, exists in Nova Scotia, and has been mined to some extent, yet varnish manufacturers, who use this material as an oxidizer, have gone abroad for their supply.

While the report points out to the producers the market and opportunities for extending it as well as the quality of mineral required for the various uses, the investigation has furnished us with information which is of great service for office use. It not only aids materially in determining the lines along which the departmental investigations are most urgently required, but furnishes us with data with which to reply to numerous letters of enquiry from owners of mineral lands and producers of minerals seeking a market, as well as from those in search of a supply of mineral for some special purpose.

Since the beginning of the war these letters of enquiry have been coming to the Mines Branch in increased volume. Our Department is now in a position to give not only a prompt reply regarding the requirements of the market, but can frequently put the enquirer into direct touch with the consumer or producer, as the case may be, of the mineral in question.

**Field Work of  
Mines Branch** As a direct result of the information obtained from this investigation, it has been possible to arrange the programme of field work for the present year and for the coming year with a view to obtaining such information as is now most required by the country. Our resources of

barytes, fluor-spar, pyrolusite, talc, tripolite, limestones and sands are now under investigation. Large quantities of these are being imported, while our resources are being drawn upon only to a slight extent. In the case of limestones and sands, the immediate need of devoting our attention to their investigation is not apparent until one realizes the immense quantities consumed, and the multitude of varieties and grades which the consumers require. Our objective is to discover sources of supply of such varieties as are not at present obtainable in Canada, and to secure data which will enable us to point out to the consumers the localities from which they may obtain such grades of material as are best suited to their needs. The work on barytes and pyrolusite is indeed timely, since the war has cut off the principal sources of supply.

#### **Monographs on Minerals**

The activity of the Mines Branch in aid of the mineral industry has, however, gone further than simply to furnish information as to what minerals the manufacturers may obtain from domestic sources, and where the miner may find a market for his product. Monographs on the different Canadian minerals have been published, which, in addition to this information, deal with the methods of mining to be employed for the different minerals, and describes the class of machinery required to prepare the mineral for the market or the smelter.

In many cases the mineral as it comes from the mine is not marketable, either because it is too low in grade to stand the transportation charges, or it contains deleterious ingredients, which require removal before the product becomes acceptable to the consumer. In other cases, an ore contains two or more valuable minerals. It becomes necessary then to separate the minerals for further successful treatment. In many cases this can be effected by mechanical means.

The processes of solving these various problems require to be suited to each case, and necessitate the use of special machinery.

#### **Ore Dressing Laboratory**

To aid the miner in solving the problem of how to prepare his ore for the buyer most effectively and economically, and give him the necessary information of what machinery to install and what costs are involved, the Mines Branch has installed in Ottawa, the Dominion of Canada Ore Dressing and Metallurgical Laboratory. This laboratory is fully equipped with ore dressing machinery of the most modern design, and is furnished with a complete assay department for the making of all necessary chemical determinations.



Apart from the Universities, there are no laboratories in Canada in which ore dressing may be carried out on a commercial scale, such as is required for the proper elucidation of ore dressing problems. The Universities maintain their laboratories primarily for educational purposes, and cannot be expected to offer facilities and an expert staff free of charge to the miner when he presents his numerous, and often difficult, problems in mineral separation.

The testing work in the Mines Branch laboratory is carried out free of charge when the mineral is of Canadian origin. The miner is required to pay all ore transportation charges, and is required to furnish not less than two hundred pounds of ore for a small scale test, and not less than five tons for a large scale test.

The reports of all tests are incorporated in the publications of the Mines Branch, but single copies are given to the owners of the samples when the tests are completed, to enable him to make use of the information immediately.

The laboratories are, of necessity, under the control and direction of officials of the Mines Branch. However, arrangements may be made for engineers or other competent persons to supervise such experiments as they are interested in. With the assistance of our laboratory and staff, mine owners can determine the possibilities of milling their ores and select the most advantageous methods of concentration. They will be enabled to make close approximations of the value of the concentrated products which, with a determination of their mining and milling costs, will put them in possession of facts concerning the actual value of their ores in the ground.

**Problems  
Awaiting  
Solution**

In the non-metallic division of minerals there are many problems that might be studied with advantage to existing conditions. The concentration of barite, fluor-spar, and chromite; the washing, classification and sizing of sands for various purposes, and the crushing and cleaning of quartz for the manufacture of glass, are but a few examples of the work that the laboratory is equipped to carry out.

All problems in the concentration and purification of minerals bear a certain direct definite relation to the value of mineral deposits and, indirectly, a definite relation to the wealth of the community in which the deposit is situated. Ore deposits are valued according to the amount of merchantable mineral they will yield from approved methods of extraction. If existing methods of extraction can be improved to yield a higher percentage of recovery, at less cost than the value of such additional output, then existing methods should be discarded, and better methods substituted.

It is not expected that these laboratories of the Department will effect any radical change in existing methods of ore dressing. But if the miner will make intelligent use of this opportunity for the scientific investigation of his ore dressing problems we predict a steadily increasing effort to increase the efficiency of present methods, and the general betterment of conditions affecting the exploitation of mining prospects.

As it is the aim of the Mines Branch to co-operate with and assist the miner in the same manner as the Department of Agriculture assists the farmer, I have thought it appropriate to show briefly in the foregoing the preparation made in the organization of the Mines Branch and equipment of its laboratories to enable the Department to render efficient aid to the mineral industry, and to such manufacturers as depend upon it.

May I, in conclusion, state it as my opinion that the efforts being made to know more of our resources and to know them more in detail should not, at present, be relaxed, but very greatly increased, so as to render us, as far as possible, independent of outside sources.

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# Our Mineral Resources and the Problem of Their Proper Conservation

BY

FRANK D. ADAMS, D.Sc., F.R.S.

*Chairman, Committee on Minerals, Commission of Conservation*

OUR natural resources naturally fall under five great divisions, which with the value of their output and export for the year 1913 are shown in the following table :

	Output	Exports
Agriculture (including cattle and dairy products)....	\$673,771,500*	\$194,930,254
Forests (1912).....	182,300,000	43,255,060
Mines.....	144,031,047	57,442,546
Fisheries.....	33,389,461	16,336,721
Furs.....	.....	5,235,907

Our manufacturing industries being based on these are here omitted from consideration, as are also our water-powers.

As will be seen, our mines rank third among our natural resources in the value of their output and second in the value of their exports. All these natural resources, except the mines, can by intelligent care and conservation be made to produce a much greater annual yield than at present, while at the same time showing a steady increase in value. These resources—agriculture, forests, fisheries and the fur trade—if properly managed, may be compared to money well invested. They can be made to yield an annual return in interest while the capital remains unimpaired or even increases in value.

**Conservation of Minerals**      The mineral resources of a country, on the other hand, are in quite a different category—they are like a sum of money or treasure hidden in the ground. It does not renew itself, and every amount abstracted leaves just so much less for future use. When in a country of great extent like Canada, the more accessible deposits become worked out, others are discovered in more remote portions of the national domain and the output is thus maintained or even increased for a series of

\*This does not include cattle, no returns for these being made to the Government except in exports.



years. The sum total of the mineral resources is, however, continually decreasing in direct proportion to the vigour with which they are exploited.

**Mineral Production in Canada** The earliest explorers to set foot in the Dominion expected to find in it a territory of abounding mineral wealth and they were encouraged in this belief by tales which they heard from the Indians. The first mineral deposits which were made the basis of regular mining operations were the coal beds of Cape Breton, where serious work began in 1720, and the bog-iron ore deposits of the St. Maurice district in the province of Quebec, which were opened up by order of Louis XV in 1733. As the country was opened up to settlement, other mineral deposits were found and other mines developed. The value of the annual production in Canada, however, increased but very slowly in the earlier years. By the year 1886, when the Geological Survey of Canada collected and published the first statistics for which approximate accuracy may be claimed, the output had reached a value of somewhat over ten million dollars, of which about one-third was derived from the coal mines of Nova Scotia. Since that time the rise in production has been rapid, reaching a value of one hundred and forty-four million dollars in 1913. This rapid increase during the past twenty-seven years is shown in the following table :

Year	Value of Production	Year	Value of Production
1886	\$ 10,221,255	1900	\$ 64,420,877
1887	10,321,331	1901	65,797,911
1888	12,518,894	1902	63,231,836
1889	14,013,113	1903	61,740,513
1890	16,753,353	1904	60,082,771
1891	18,976,616	1905	69,078,999
1892	16,623,415	1906	79,286,697
1893	20,035,082	1907	86,865,202
1894	19,931,158	1908	85,557,101
1895	20,505,917	1909	91,831,441
1896	22,474,256	1910	106,823,623
1897	28,485,023	1911	103,220,994
1898	38,412,431	1912	135,048,296
1899	49,234,005	1913	144,031,047

In comparing the individual items making up the mineral output for the year 1913 with those of the year 1886, it is found that there has been an increase in the output of nearly every mineral substance mined in the Dominion. While the increase has been relatively greater in the group of the metals, it has also been enormous in the case of the non-metallic minerals and especially structural minerals and clay products. The only mineral substances which were mined in larger amount in 1886 than in 1913 are antimony ore, chromite.

manganese ore, baryta, molybdenite, petroleum and phosphates. The output of the first five mentioned of these substances in Canada was never very large and gradually ceased, owing to the fact that the more easily accessible supplies of these raw materials became exhausted.

**Nickel and  
Silver in  
Canada**

During the period under consideration, some extensive and very valuable ore bodies have been discovered in the Dominion, among which may be mentioned the nickel ores of the Sudbury district and the silver ores of Cobalt. The former has now developed into the greatest nickel producing area in the world and is known to contain such enormous ore reserves that the present production can be continued for many years. The Cobalt district, on the other hand, while not discovered till 1903, developed almost immediately into the greatest silver camp in the world, but has already passed its period of maximum production, and although it will for years to come still produce large amounts of this precious metal, is already in a state of decline.

**Depleted  
Mine Areas**

This is but repeating the experience of the older countries of the world where what were once great mining regions have become completely exhausted.

As instances, the Kongsberg mines of Norway may be cited, which at one time produced great masses of native silver rivalling those now obtained from Cobalt, the lead mines of Great Britain now completely abandoned, the renowned mines of the region of Freiberg in Saxony worked continuously since 1170 A.D., the last of which is now about to be closed down, and the great diamond fields of the Golconda district in India, which no longer yield these precious gems.

In modern times it must be remembered that with the introduction of high explosives and modern machinery, the exhaustion of a mineral deposit is much more speedily attained than in former times when only a relatively small tonnage could be raised annually from any mine.

The discovery and development of mining districts in any country, even although these must be exhausted in time, always attract population and yield wealth to a community in the early stages of its development and are thus frequently of the utmost importance in bringing about the opening up and settlement of tracts of country whose inhabitants subsequently engage in other industries and find other means of support.

**Canada's  
Coal Resources**

In Canada, however, our mineral deposits are of great extent and importance. Our coal resources, as shown by the investigations undertaken in con-

nection with the meeting of the International Geological Congress which was held in Canada last year, are among the countries of the world, second only to those of the United States. The geological structure of the Dominion is furthermore such as to lead to the confident belief that as northern Canada is made more accessible by the improvement of means of communication, thus facilitating exploration, large deposits of the metallic minerals will be found in the more remote portions of the Dominion, which, when opened up, will be important factors in the development of all the other latent resources of that great region—so that the mining industry of the Dominion, there is every reason to believe, will continue to grow and to play a very important part in the future history and development of the country.

#### Results of Wasteful Mining

While we cannot hope to increase our mineral resources by any process of conservation, it is of the greatest importance that, in working them, all waste should be avoided. The losses which have been sustained in other countries from lack of care and thought in this respect are enormous. Dr. Douglas estimates, for instance,—to take only one example—that at the Rio Tinto mines in Spain, in a period of some thirty years, through an unskilful treatment of the ore, about 7,000,000 tons of sulphur, valued at not less than \$70,000,000, were wasted, while through modern improvements in the method of handling the ore about 1,000,000 tons of sulphur are annually saved to the world which would otherwise have been burned and served simply to pollute the atmosphere. The same writer points out that only some sixty per cent of the hundreds of millions of dollars yielded by the Comstock lode was recovered at the time, and at first the enormously rich tailings were not even collected, such was the haste of the miners to empty that stupendous deposit which should have made Nevada prosperous for generations instead of whirling the whole country into a mad dance of reckless speculation.

The primary cause of a large part of the waste which has taken place in mining enterprises is over-capitalization. This necessitates a large output at any sacrifice if the dividends are to be paid on the whole amount. Over-capitalization thus demands over-production, which in its turn almost invariably involves waste at some stage of the progress of the metal from the mine to the consumer. On the other hand, a lack of sufficient capital to develop a mineral deposit in the proper manner has in more than one case in Canada led to serious waste, since in the endeavour to make the mine pay the cost of its own development as mining proceeded, only the richer



ore was taken out, leaving the leaner portions of the deposit in positions which rendered subsequent extraction difficult or impossible.

**Mining of  
Metallic  
Minerals**

It may be stated, however, that in Canada at the present time the waste which is incurred in working our deposits of metallic minerals is small. It is, as a general rule, to the miner's interest to extract his ore completely and to avoid waste. Certain losses take place in the concentration of ores by allowing values to pass away in the tailings. But in recent years, the methods of concentration have been greatly improved and the tailings are much lower in grade than in former years. It is doubtful whether there is in Canada at the present time any considerable waste in the concentration of metallic ores which can well be avoided. Furthermore, where the tailings, as in certain places in the Cobalt district, while still containing in the aggregate large amounts of metal, are too low in grade to permit of further extraction at the present time, they have, on the suggestion of this Commission, been stored in such a way that if, in the future, it becomes possible to treat them again for the further extraction of their metallic contents, they will be readily available for that purpose.

#### MINING AND HANDLING OF COAL IN CANADA

The most serious waste which is taking place in the Dominion at the present time is to be found in the mining and subsequent treatment of coal and in connection with our supplies of natural gas. It is to these that I desire to make especial reference at the present time. And here it is first a matter of interest to note how large a saving of coal is being effected by the development of our water-powers.

In Canada, in the year 1913, the water-power available on the turbine shafts of our electric installations amounted to 1,100,000 h.p. Assuming that under average conditions one horse-power hour can be produced in a steam plant from three pounds of coal, then 1,100,000 h.p. calculated on a twelve-hour basis and taking a load factor of 50 per cent, which is a conservative allowance, represents a saving of 2,750,000 tons of coal per annum. When it is remembered that the total output of coal in Canada for the same year amounted to only 15,115,089 tons, these figures are all the more striking. It is also interesting to note that the development of our water-powers is as yet only in its infancy, that an immense volume of power is annually running to waste, and that each horse-power per year that thus runs away unutilized is equivalent to the burning up and destruction of five tons of coal.

### Situation of Coal Areas

While Canada contains abundant supplies of coal, the coal beds are chiefly in more or less inaccessible regions. The investigation into the coal fields and coal resources of Canada which was carried out in connection with the meeting of the International Geological Congress held in Canada in 1913, showed that less than one per cent of the coal resources of the Dominion are situated in Nova Scotia and New Brunswick, while 87 per cent lie in Alberta, much of this coal being in very remote districts of that province.

The coal seams which are now being worked are those which contain the coal of the best quality and in the most accessible regions and those which are nearest to what are, and always will be, the great centres of population in the Dominion. They are, therefore, speaking generally, the deposits from which coal can be delivered most cheaply. When coal can no longer be obtained from these districts, or, if for any reason it becomes more difficult to extract coal from them, the price of coal will tend to rise.

In a coal-bearing district the measures usually contain several distinct coal beds, overlying one another and often differing more or less in thickness and quality. If, in opening up such a district, the operators, in order to obtain a large supply of good, cheap coal at once, select without any regard to ulterior consequences a single bed as that which can be most conveniently worked at the lowest operating charges, and rob this seam of its coal solely with the view to the largest immediate output, the workings, after the extraction of a portion of the coal, will crush in, making it very difficult and often impossible ever to secure the rest of the coal in this particular seam or any of the coal in the other beds overlying it. The final result of this method of mining is that a very small percentage of the coal in the area is won and all the rest is absolutely and inexcusably wasted.

Again, there are beds of coal in Canada which are so thick that it is difficult, in fact, in some cases, impossible, to work the whole thickness of the seam at once. Consequently, the upper or lower portion of the seam alone is worked, leaving the rest behind. In such cases, when the workings collapse after the cessation of mining, there is a serious danger of losing the coal in the other portion of the seam. The loss, however, even under these circumstances, can be minimized if a proper and uniform plan of working the seam is adopted from the first.

Again, where there are thin seams of coal alternating or interstratified with thicker beds in a series of measures, the coal in the thicker seams, which are easily and profitably worked, is often extracted, leaving the thinner seams untouched. These—which

could be worked at the same time as the thicker seams at a comparatively small cost—when the thicker seams have been removed and the workings have collapsed, are frequently so much shattered that the coal which they contain is forever lost.

**Waste in  
Coal-Mining**

In the methods of working a coal-seam which are usually adopted a large part of the coal is left in the mine during the working in the form of pillars for the purpose of supporting the roof. These pillars, in the final stages of the mining of any area, can be in part removed, but a large part of the coal, which may be stated to be on an average 50 per cent of all the coal originally present in the seam, remains in the mine and is permanently lost. By adopting what is known as the "long wall system"—where this is possible—a much more complete extraction of the coal may be secured.

The excessive use of powder also entails a loss of coal owing to the fact that it breaks up the coal and, in this way, develops a relatively very large amount of slack, accompanied with increased danger from fire and explosion.

All these causes of waste are illustrated in the coal-fields of Canada. It may be stated that, in the coal-fields of Nova Scotia, the amount of coal which has been wasted is at least as great as that which has been extracted. This is apart from, and in addition to, the coal necessarily left in the mines under the methods of mining employed. This waste aggregates in amount to tens of millions of tons. It is a satisfaction to note, however, that the greater part of the waste in question took place in the earlier years of the coal-mining industry in this province, at a time when there was no effective government supervision. At the present time, every mining company operating under lease from the Government of Nova Scotia is required to submit in advance the plans which it is proposed to follow in opening up any coal-seam. These plans must be approved by the Chief Inspector of Mines, under whose supervision the actual mining of the coal is also carried out. The waste of coal has thus been greatly diminished and would be reduced still further were it not that in many cases it is now very difficult to introduce the best methods of extraction owing to the condition in which the mines have been left by the early operators.

**Coal-Mining in  
Western Canada**

In the great coal-fields of the provinces of Alberta and Saskatchewan, which are now commencing to be opened up and whose mineral wealth is the property of the Dominion Government, by whom the right to mine for coal in certain areas is leased for a certain definite term of years, the experience of the early days of Nova Scotia mining is now being



repeated. The Department of the Interior, under the Dominion Government, has mining inspectors whose functions, after the leases have been granted, consist essentially in collecting the royalties on the coal extracted ; the respective Provincial Governments also have mining inspectors whose duty consists in seeing that the mining is carried on in such a way that the lives and limbs of the miners are safeguarded ; but, so long as the royalties are paid and the mining carried on with due regard to the safety of the men, the operators are at liberty to adopt any methods of mining which they please, no matter how wasteful these may be, and without regard to the condition in which the mine will be left when their lease expires. The methods which have been used and are now being employed in many parts of these coal-fields are eminently unsatisfactory in this respect and steps should be taken now in the early days of the development of the coal-fields to render impossible a repetition of the mistakes which are made in the older coal-fields of Eastern Canada. To this end, an officer of undoubted capacity and integrity and with wide experience in the mining of coal should be appointed as Chief Inspector of Mines by the Dominion Government, to whom, among other things, all plans for the development of the coal mines working under lease from the Dominion Government should be submitted in advance, and whose approval of the same should be necessary before the actual work of mining is begun, as is the case in all mines now worked under lease from the Provincial Government of Nova Scotia or from the owners of coal-lands in Great Britain. The mines should also, as in these cases, be inspected regularly by the Chief Inspector, or his assistants, in order to see that the plans which have been approved are being properly carried out.

**Power Efficiency  
of Coal**

From the coal which is mined and burned under boilers in the usual manner, only about 12 per cent of the total efficiency is developed. And if, as is usually the case, only 50 per cent of the coal is taken from the mine, there is secured only about six per cent of the total efficiency of the coal contained in the area worked. If the coal is burned in gas producers and if the gas so obtained is used in internal-combustion engines, a higher efficiency amounting to about 30 per cent of the energy in the coal actually mined, or about 15 per cent of the energy locked up in the coal of the whole area, is obtained. This is a distinct advance in efficiency but still represents an enormous waste. It is a waste, however, which at the present time we are unable to avoid.

On the other hand, the coal may be mined for the production of coke for metallurgical purposes. This was formerly made in the so-called beehive furnaces, from which a relatively smaller yield

of coke is obtained and all the other products yielded by the coal—gas, tar, ammonia, benzol, etc.—go to waste. In the best modern practice, however, the coal is coked in what are known as by-product ovens from which a larger percentage of equally good coke is obtained and all these other products are saved. About three-quarters of all the coke produced for metallurgical purposes in North America is still made in the old beehive ovens. They flame for miles in Pennsylvania and excite no comment, while the burning of a \$1,000 house would draw a mob, and yet the waste is enormously greater. It has been estimated by Messrs. Campbell and Parker of the United States Geological Survey that, at the prices which prevailed in 1907, the value of the by-products wasted in the beehive ovens in that country was a little over \$55,000,000, and that, on the other hand, the value of the by-products from the retort ovens in the same year was a little more than one-third the value of the coke produced in them.

In Canada, by-product ovens are used by the Dominion Coal Co. at Sydney and by the Algoma Steel Co. at Sault Ste. Marie, but these are the only ovens of this type in the Dominion.

**Coking of  
Coal in  
Western Canada**

The coke which is used for metallurgical operations in Western Canada is all made in beehive or Belgian ovens. While in these latter the gas given off by the coal is drawn off and may be used for heating purposes, the by-products, as in the case of the beehive furnaces, go to waste. There are at present in Canada, 2,024 ovens which do not save the by-products as against 730 which do save these valuable constituents of the coal. In Western Canada there are 1,935 ovens of the former class and none of the latter.

Mr. F. E. Lucas, manager of the coke ovens of the Dominion Coal Co., estimates the saving effected by the use of the by-product oven to be \$1.93 per ton of coke made. This figure will, of course, vary to a certain extent with the locality in which the coke is produced, but it indicates the great additional yield which is secured when coal is coked by modern methods, more especially when the enormous tonnage of coke consumed in modern smelting is borne in mind. In the year 1912, as much as 405,457 tons of coke were made in beehive ovens in Alberta and British Columbia, representing a waste of approximately 12,569,167 pounds of ammonium sulphate and 43,383,899 gallons of tar; not to mention the benzol, creosote and other minor products and the immense amount of gas which would be available for heating and lighting purposes.

The principal objection which is urged to the introduction of the by-product oven is the expense of installation. But it is hoped that this objection will be overcome wherever possible since, as shown above, the by-products have high economic and market values and there will be a growing demand for them.

The tar is already being used extensively in the Dominion for a variety of purposes, among which may be especially mentioned that of the manufacture of briquettes from slack coal, thus effecting an additional economy in the utilization of this waste product. Ammonia on the other hand is a fertilizer of the greatest value, for which there is a great demand abroad and for which an ever-increasing demand will arise in Canada as the necessity of employing improved methods of agriculture is brought home to farmers. The by-product coke ovens of the United States produced in 1912 ammonia and ammonium sulphate to the value of \$9,519,268.

For some years past in England and Germany attention has been paid to the problem of securing the largest possible yield of ammonia from coal during the process of coking. With the methods of coking ordinarily adopted at the gas works in these countries only about one-sixth of the nitrogen in the coal is obtained in saleable form as an ammonium compound. It has been found, however, that, by employing certain improved methods, the yield of ammonia may be increased by as much as 200 per cent.

The immense volumes of gas given off from the coal in the by-product ovens might be readily utilized in connection with associated industries, as, for instance, the burning of cement.

#### **Fuel Supply on the Prairies**

One of the most important problems which presents itself at the present time is the provision of an adequate supply of cheap fuel for the population of the Prairie Provinces of Canada. Very large areas of these provinces are underlain by beds of sub-bituminous coal and lignite which are estimated to contain 100,000,000,000 tons of these fuels. As yet, however, practically all the fuel in that portion of the plains east of Brandon is imported from the United States, while that used in the country west of Brandon is brought chiefly from the coal-fields of the Rocky mountains. This entails a long and expensive haul which results in a high-priced fuel, and any temporary interruption of the supply gives rise to a coal famine.

The reason why the mineral fuels of the plains have not been utilized is that they are expensive to mine owing to the absence of supplies of mine timber on the treeless prairies, and they are also of a lower grade than the fuel from the Rocky mountains, containing a large percentage of moisture. They thus have a lower



heating value than the fuels from the mountains, and furthermore when, after being mined, they are exposed to the atmosphere, they dry out to a certain extent and in so doing crumble to pieces or even fall to powder, so that they cannot be readily handled and will not bear transportation. Such being the case, if these fuels are to be made available for household use, they must be briquetted, or if they are to be used for manufacturing purposes, they must be either briquetted or used in gas producers.

**Scientific Tests  
of Fuels**

A series of trials of Canadian fuels recently carried out by Dr. J. B. Porter and Prof. Durley of McGill University for the Mines Branch of the Department of Mines at Ottawa, show that these fuels of the plains are excellently adapted for use in the gas producer and are thus well adapted for the production of power. The question as to whether they can be briquetted when necessary at a sufficiently low cost to make the enterprise commercially profitable, has not yet been established. Fuels of this general type in Germany are briquetted on an enormous scale, and the United States Bureau of Mines is now investigating the possibility of briquetting the lignites of North Dakota. Any lignite can, of course, be briquetted if a suitable binding material is employed. This, however, entails additional expense, but many of the German lignites and some of those occurring in North Dakota can be briquetted without the addition of any binding material. It is thus very important that an investigation should at once be made into the question as to whether there are not, among the great deposits of fuel underlying the Canadian plains and outcropping on their surface, some at least which can be worked for the production of a cheap briquetted fuel which will stand transportation and thus supply a need ever more insistent as the population of the Prairie Provinces increases. Such an investigation is to be commenced next summer by the Mines Branch of our Department of Mines and the results will be awaited with much interest.

**Waste Due to the  
Smoke Nuisance**

Another source of waste in the case of our fuel supplies is represented by the smoke nuisance which is now becoming very pronounced in our large cities. While it is difficult to prevent the smoke rising from the chimneys of private dwellings, this in the cities of Canada is relatively small in amount, for, as a general rule, hard coal is burned for domestic purposes. On the other hand, the immense volumes of smoke emitted from the stacks of many of the great power plants and factories of our large cities as well as by locomotives and steamboats can be greatly reduced or stopped by the installation of proper smoke consumers operated by firemen who have been instructed in their proper use.

Investigations show that such plants, in many cases, not only stop the smoke but pay the owners.

The waste of fuel, however, is but a small part of the loss entailed by the smoke in our cities. It disfigures buildings, impairs the health of the population, renders the whole city filthy, destroys any beauty with which it may be naturally endowed and tends, therefore, to make it a squalid and undesirable place of residence, and this, at a time when economic influences are forcing into our cities an ever-increasing proportion of our population. These conditions press especially on the poor who must reside in the cities and cannot escape from these evils by taking houses in the suburbs. After all, the conservation of humanity is even more important than the conservation of coal.

**Checking the  
Smoke Nuisance** Investigations into the best means of abating the smoke nuisance have been, and are now being, carried on by government and municipal commissions as well as by private individuals in several of the leading countries of the world. Many cities have officials whose time is devoted exclusively to the education of public opinion and the enforcement of existing laws with reference to this matter. The question as to what steps can best be taken to lessen the amount of smoke which is being discharged into the atmosphere in our Canadian cities is by no means a simple one, but the time has come when the Commission of Conservation may very properly make a thorough investigation of the question and ascertain for the benefit of the dwellers in our great cities what can be done to prevent the wholesale pollution of the atmosphere.

#### NATURAL GAS RESOURCES OF CANADA

Natural gas is the most perfect fuel with which we are furnished by nature. It is clean, can be readily piped for long distances and has a very high heating power. Consequently, when it is found in large quantities, it speedily supplants all other kinds of fuel. It is a material, however, which has been produced very slowly and the great volumes of it which are found stored in certain favourable situations within the crust of the earth represent the result of a slow process of accumulation extending over an enormous lapse of time.

The gas, however, is often under great pressure in the earth's crust and, when tapped by bore-holes, frequently escapes in such enormous volumes that persons unacquainted with the conditions of its occurrence are led to believe that the supply is so great as to be practically inexhaustible, or that at any rate the exhaustion of the

field is a contingency so far removed in the future that its discussion is a matter of purely academic interest.

**Natural Gas in  
United States**

The greatest supplies of natural gas hitherto discovered are those of the United States and these gas-fields are those which are nearest in position to the Canadian fields. The gas-fields of the United States have now been operated for some thirty years and the experience drawn from them is directly applicable to the problems presented by the gas-fields of Canada which are now in a relatively early stage of their development.

What has been the experience in the United States ? It is that within a few years after its discovery the output of gas in one field after another in which the supply was supposed to be inexhaustible is found to be gradually lessening, and in some of the fields where natural gas was at first so abundant that it was the fuel almost exclusively employed in the great factories of the district as well as for private use, the supply is now practically exhausted and it has been necessary to return to coal.

In fields where the supplies have not as yet been exhausted the decline in pressure, indicating approaching exhaustion, has been marked. One of the most rapid declines is that seen in the fields of northern Indiana, where the pressure dropped from 400 pounds in 1886 to 50 pounds in 1902. Thus those fields were practically exhausted within 15 years. McDowell states that three times as much gas was wasted in those fields as was used.

Other instances of quick decline are found in Kansas and Oklahoma. In the latter state the rock pressure of the gas in the Hogshooter field in 1912 fell off at the rate of a pound a day, and only recently the volume of gas yielded by the Copan field, in the same state, dropped in a single year from 300,000,000 feet per day to 100,000,000 feet per day. In Louisiana a similar decline is noted. In a well of the Midway field in California, the 16-inch casing tapped a gas sand at a depth of 540 feet ; the flow was 50,000,000 cubic feet per day for a few days, and then practically ceased.

The experience, in short, has been that no gas field is inexhaustible, but that each has a life extending over a comparatively few years. Consequently, the supply of gas in any district which is fortunate enough to possess one, should be carefully husbanded.

The decline in the yield of the gas-fields of the United States has been greatly accelerated by the enormous waste which was allowed to take place in the earlier years when the gas appeared to be so abundant that it was difficult to persuade people that it would not last forever. Dr. Orton states that in the early days of the



Ohio gas fields the operators tried to believe that the gas was being formed within the earth as fast as it was being allowed to escape or comforted themselves with the aphorism that "Nature would not go back on us." The supplies, however, fell off there as elsewhere.

**Waste of Gas  
in United States** Dr. I. C. White in his address before the great Conference on Conservation held in Washington in 1908 made the following statement with reference to the waste which was taking place in the United States at that time :

"The blazing zone of destruction extends in a broad band from the lakes to the Gulf and westward to the Pacific, embracing in its flaming pathway the most precious fuel possessions of a continent. No one can even approximate the extent of this waste. From personal knowledge of the conditions which exist in every oil and gas field, I am sure the quantity will amount to not less than 1,000,000,000 cubic feet daily and it may be much more. The heating value of a billion cubic feet of natural gas is roughly equivalent to that of 1,000,000 bushels of coal. What an appalling record to transmit to posterity !"

Dr. David T. Day, of the United States Geological Survey, estimated that, in 1908, about one-half of all the natural gas which was produced by the gas wells in the United States, was wasted.

Mr. McDowell states that the daily waste of gas in Oklahoma by escape into the air is at present equivalent to the destruction of at least 10,000 tons of coal daily, and that 80 per cent of this loss is preventable.

Now in the United States when the horse (or a considerable part of him) has been stolen, the stable door is being shut. Legislation has been passed and so effectively enforced in Indiana, Ohio and Pennsylvania that the waste of natural gas in these states has practically ceased. The laws of Indiana, Ohio, Pennsylvania and West Virginia call for the proper capping of every well when not in use. In other states of the Union, however, where preventive legislation does not exist, the waste is still enormous. It is estimated by the Director of the United States Bureau of Mines that the aggregate waste in the United States at the present time exceeds a value of 50 million dollars per annum, of which 80 per cent might be readily saved.

**Sources of Gas  
in Canada** Natural gas first appears in the statistics of the mineral products of Canada in the year 1892, when the total output had a value of \$150,000. In 1913 this had risen to \$3,360,000. This comes from the provinces of Ontario, New Brunswick, Saskatchewan and Alberta.

The most highly productive area at the present time is the extreme southerly portion of Ontario, in a strip of territory along the shore of lake Erie, the total product here having a value of rather over \$2,000,000, of which about two-thirds comes from Kent county.

The discovery of natural gas in New Brunswick is of much more recent date and the output has risen rapidly in the last few years, having a value in 1913 of \$174,006. The field is situated in Albert county and supplies gas to Moncton and Hillsborough.

In Saskatchewan and Alberta gas has been found in places over a wide stretch of country along the line of the Canadian Pacific railway from Medicine Hat to Calgary and thence to the north as far as Pelican portage, about half way between Edmonton and lake Athabaska.

While it is known to have a wide distribution, the gas which has been used so far has been obtained from two fields known respectively as the Medicine Hat and the Bow Island gas-fields. From the former, gas is taken to Medicine Hat and from the latter the gas is piped to Lethbridge and Calgary, 160 miles distant, supplying also intermediate points along the route. The total product of Alberta in the year 1913 had a value of rather over one million dollars.

There is, however, every prospect that new productive gas-fields will in the future be opened up in other parts of the provinces of Saskatchewan and Alberta as well as elsewhere in the Dominion. And having in mind the experience of the United States, definite steps should at once be taken to prevent all waste. It is to be noted that the gas field in Essex county, Ontario, formerly highly productive, has now ceased to yield, and that a falling off in the supply of gas is already seen in certain other Canadian fields.

**Waste of Gas  
in Canada**

The most striking case of the waste of natural gas in the Dominion is the great column of gas which has been escaping from the bore-hole put down by the Government near Pelican portage, Alberta, in 1897. The records show that in this well, at 820 feet, "a tremendous flow was struck the roaring of which could be heard at a distance of three miles or more." This gas has been burning like an immense torch almost continuously for the past 17 years.

The district in which this gas is escaping is at present somewhat remote from settlement, but it is a district which is nearer to Edmonton than Calgary is to the great gas wells which supply it, and yet this gas, representing a great accumulation of the finest fuel, which might have formed the basis of important industries in Edmonton, has been for all these years running to waste.

In endeavoring to arrive at some estimate of the waste of gas which has taken place at this well, Mr. W. J. Dick, Mining Engineer of the Commission of Conservation, at my request communicated with Mr. Louis G. Huntley, of Pittsburg, Pa., the engineer who examined the well for the city of Edmonton in 1913. Mr. Huntley writes as follows :

"When the writer visited this locality in 1912, he estimated the flow of the old Government well at something less than a million cubic feet per day. In 1913, Mr. Williams of the Pelican Oil & Gas Co. reported to his stockholders that the well pressure was 225 lbs. per square inch with a flow of about 840,000 cubic feet per day. The writer again visited the well in 1913 in connection with the report for the city of Edmonton, and while more gas was being used for fuel for drilling purposes, the flow seemed somewhat less than the previous year. Mr. Williams would not allow the well to be gauged, however, although it was still blowing into the air through a one-inch pipe.

"While Mr. Williams' statement may have been somewhat optimistic, yet it is reasonably certain that the well was not making more than his estimate, viz., 840,000 cubic feet. Now, in line with Orton's hydrostatic theory of underground pressures, and knowing the difference in elevation of the Dakota sand at Pelican and its nearest outcrop at Boiler rapid to be very close to 500 feet, the pressure would theoretically be 260 lbs. per square inch in the Dakota sand at a depth of 820 feet at Pelican. This coincides very well with Mr. Williams' report of 225 lbs., and it is believed that probably the pressure was not much higher in 1897 than it is at present. However, the flow of gas from this well has decreased very greatly, according to the reports of those who make yearly trips down the Athabasca river. There is no certain way of estimating the original flow of this well when drilled 17 years ago. However, in the writer's judgment, an eight inch hole at a pressure of 260 lbs. would not produce more than a maximum of 5,000,000 cubic feet per day from a sand of the character of the Dakota ; in other words, an average flow of 2,900,000 cubic feet per day for 17 years. This may be regarded in the nature of a maximum figure and is very approximate, due to our assumption of a fairly constant pressure at all times. However, in a sand as uniformly coarse as the Dakota, with a uniform dip to its outcrop at Boiler rapid, it is difficult to imagine a much greater pressure to exist at Pelican than one equal to the hydrostatic head, due to the difference in elevation of the sand at the two points. In all fields far removed from the outcrop of the gas-bearing formation, where many wells are drawing from the same area, a drop in pressure of from 30 to 100 pounds per year is the rule. But with one well only draining the district, and other conditions such as at Pelican, I believe we are safe in the assumption that the pressure was never much above 260 lbs., the flow decreasing due to the greater distance through which the gas must now travel to reach the well."



Taking the amount of gas which escaped daily at 2,900,000 cubic feet, a simple calculation shows that this amounts to 17,994,500,000 cubic feet in 17 years. The average price for natural gas in Canada in 1913 was 16.4 cents per 1,000 cubic feet, which would give \$2,951,098 as the value of the gas wasted. Even if this estimate be reduced by 50 per cent, the waste still remains enormous and inexcusable.\*

Furthermore, another point must be borne in mind in connection with these supplies of natural gas, and that is that the gas often travels for long distances underground and a waste at one point affects not merely the supply in its immediate vicinity, but often exhausts the supplies of gas in the entire field underlying a great tract of country, so that it is not merely the area about the point of escape which is affected, but the whole surrounding region whose potential development is seriously impaired by the destruction of one of its great natural resources.

**Legislation re  
Gas in Ontario**

With the single exception of Ontario, no province in the Dominion at the present time requires gas wells, which are not being used to be plugged, and this province has further reduced the waste in the area under its jurisdiction by levying a tax of two cents per thousand feet with a rebate of 90 per cent for the gas that is actually used. The Dominion Government and all the Provincial Governments should at once pass enactments requiring all gas wells which have been abandoned, or are not in use to be plugged. Legislation similar to that in force in Ontario should also be passed by the Dominion Government and the other provinces requiring the payment of a royalty on gas with a suitable rebate for the gas actually used. Natural gas, when discovered enters into direct competition and supplants coal which pays a royalty to the Government and the rebate, if properly adjusted, makes waste unprofitable and, therefore, tends to stop it.

The public should also be brought to realize that there are many forms of waste against which it is difficult to legislate, but which are none the less disastrous. Among these may be mentioned the custom of selling natural gas at a flat rate of so much per burner per month instead of at so much per 1,000 cubic feet. The inevitable tendency of this, as seen in Medicine Hat at the present time, is to

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\* In a recent article (see *Mine, Quarry and Derrick*, April 14th, 1915) Mr. R. W. Brock, formerly Director of the Geological Survey of Canada, gives a brief history of this well. He points out that the material carried up by the rush of escaping gas from time to time partly plugged the well, and that the well was at one time capped by the officers of the Government, but was later reopened by some miscreant, so that the waste of gas, although enormous, was probably not so great as set forth in the calculation given above.

allow the gas in the street lamps to burn all day, seeing that it costs no more to do so, while at the same time it is easier to let it burn than to turn it out, and the spectacle of gas blazing throughout the day conveys a general suggestion of the abundance of a product which one can afford to waste so lavishly. No company manufacturing coal gas sells it in this manner since they clearly recognize that if they did so the gas would certainly be wasted and all profits would disappear. Natural gas should always be sold at a definite rate per thousand cubic feet. Furthermore, since natural gas has not, as a general rule, a very high illuminating power, the best and most economical results are obtained, if instead of burning a large number of jets as open flames, a relatively smaller number are used with incandescent mantles, which greatly increase the illuminating power of the gas.

Economy may also be practised when the gas is used for the development of power. Thus 80 to 130 cubic feet of natural gas are required to develop one horse-power per hour when the gas is burned under a boiler and the steam produced is used for driving a steam engine of the ordinary type. The same power can be developed with a consumption of 9 to 15 cubic feet per hour in a gas engine of equal reliability and the same cost of maintenance. Hence a great saving can be effected if the gas is employed directly in a gas engine. It must always be remembered that the prevention of waste in the case of our mineral resources is the only true conservation.

# Some Recent Investigations and Legislation Affecting the Mining Industry

BY

W. J. DICK

*Mining Engineer of the Commission of Conservation*

I HAVE prepared summary statements concerning some of the important investigations and legislative changes made during the year in so far as they affect the Canadian mining industry. For convenience, they are discussed under the following heads :

- I. Fuel testing.
- II. New legislation affecting conservation of natural gas.
- III. New legislation affecting safety at coal mines.
- IV. First-aid work at mines.

## I. FUEL TESTING

The fuel testing plant of the Mines Branch, Department of Mines, is well equipped for testing fuels on a commercial scale. Samples of lignite from Alberta have been tested in a gas producer and steam generator, for the purpose of ascertaining the value of these fuels for the production of a power and industrial gas and for steam raising.

Analyses of coal samples from different seams of a producing mine are made and their heating value determined. In this way the coal contained in the various seams of all producing mines will, in time, be classified in such a manner that any prospective purchaser of coal may intelligently select the coal best adapted for the purpose for which it is required.

For the purpose of investigating the value of our low-grade fuels for briquetting purposes the fuel testing station has been recently extended by the addition of the roaster and briquetting building.

The importance of this subject, particularly to the Prairie Provinces, has been fully discussed in previous reports of this Commission.

As gas and coal dust explosions have occurred rather frequently in coal mines in Canada, the laboratories have been equipped with apparatus for the complete analysis of mine gas. It is believed that systematic sampling and analysing of mine gas at various times will



do much towards reducing the danger of explosions and make it possible to draw up regulations which will enhance the safety at coal mines.

In 1912, the Legislature of the province of Saskatchewan voted \$3,000 "to provide for enquiry into the practicability of producing power at coal centres and distributing it throughout the province." The finding of this enquiry is contained in a *Report on Coal and Power Investigation*, by R. O. Wynne-Roberts, 1913.

Last year experiments were carried on at the Provincial lignite experimental station at Estevan. Although the results of these experiments have not been published in a report, the following is a brief outline of them :\*

1. Crushing and drying of lignite to eliminate moisture. The larger lumps of dried fuel can be used for steam raising by firing boilers with automatic stokers. The smaller sized lumps to be used for briquetting or carbonizing.

(a) *Lignite briquettes* : The carbonized lignite briquettes are fully equal to anthracite coal, ton for ton, and can be marketed at a very much lower price than any other domestic fuel of equal value sold in this territory.

(b) *Carbonized lignite* : That is, lignite from which all the volatile matter has been distilled.

On carbonization, the products are :

(1) Gas, per ton of lignite.....	10,000 cubic feet
(2) Oil or tar, per ton.....	15 gallons
(3) Ammoniacal liquor.....	35 "
(4) Carbon residue.....	1,200 pounds

Mr. Wynne-Roberts states that the gas has a heating value of 400 B.T.U.'s ; that there is a surplus of 4,000 cub. ft. of gas per ton, over that required to carbonize the next ton ; that it can be used as a fuel or as a source of power, and that the power derived from it costs less than Niagara water-power.†

The lump carbonized lignite is an ideal gas producer fuel ; the amount of gas is equal to that from anthracite coal, pound for pound, but the gas is richer and contains less tar and clinker.

\* Condensed from an article on "Saskatchewan Lignite," *Journal of the Canadian Peat Society*, 1913, Vol. 3, No. 3. This article is stated to be a brief summary of a talk given before the Regina Board of Trade, by S. M. Darling, who is in charge of the experimental station.

† The article does not state how the gas is used, whether in gas engines or burned under boilers.—W. J. D.

## II. NEW LEGISLATION AFFECTING CONSERVATION OF NATURAL GAS

Since 1910, the Committee on Minerals has pointed out, from time to time, the waste of natural gas arising out of inadequate legislation. The waste from the Pelican Portage well, alone, based on the average price for natural gas in Canada in 1913, is estimated at more than \$2,951,098.\*

In January, 1914, the Dominion Government, by Order in Council, approved new regulations for the disposal of petroleum and natural gas rights. The provisions relating to the conservation of oil and gas are as follows :

"The lessee shall at all times take reasonable measures to prevent the injurious access of water to the oil-bearing formation. Upon a well proving to be unproductive, or ceasing to yield oil in paying quantity, or being abandoned for any cause, the lessee shall be at liberty to withdraw the casing from the said well, but in order to prevent water gaining access to the oil-bearing formation, the lessee shall immediately close the well by filling it with sand, clay or other material which may have the effect of preventing water from gaining access thereto.

"In case natural gas is discovered through boring operations on a location, the lessee shall take all reasonable and proper precautions to prevent the waste of such natural gas, and his operations shall be so conducted as to enable him, immediately upon discovery, to control and prevent the escape of such gas.

"Should salt water be encountered through operations on a location, the lessee shall immediately and effectively, to the satisfaction of the Minister, close the well at such a depth as may prevent such water from gaining access to the oil-bearing formation.

"The Minister may, from time to time, make such additional regulations as may appear to be necessary or expedient, governing the manner in which boring operations shall be conducted, and the manner in which the wells shall be operated.

"Failure on the part of the lessee to comply with the above requirements, or to comply with such other requirements as the Minister may consider it necessary to impose in respect of boring and operating, will render the lease subject to cancellation at the discretion of the Minister."

## III. NEW LEGISLATION AFFECTING SAFETY AT COAL MINES

**Alberta** On the 19th of June, 1914, an explosion occurred in the mine of the Hillcrest Collieries, Hillcrest, Alberta. At the time of the explosion there were 235 employees underground and, of these, 189 lost their lives.

A Commission was appointed by the Alberta Government to determine the cause and effect of the disaster. The report, signed by A. A. Carpenter, Commissioner, states, in part :

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\*See foot-note, page 68. *Ed.*

"The only conclusion, therefore, that I can arrive at, as a result of the whole evidence adduced at the enquiry, is that the disaster was caused by an explosion of gas, the origin and seat of which is unascertainable, this explosion being augmented by the ignition of dust throughout the mine.

"Although the cause of the explosion cannot be determined, a consideration of the facts and circumstances brought out by the evidence at the enquiry suggests certain recommendations which, it is submitted, may lessen the extent of the danger that was shown to be attendant upon the operation of this mine."

As a result of these recommendations, General Regulations, under Section 138 of the Mines Act of Alberta, were passed by Order in Council, Nov. 11th, 1914, covering them and providing for greater safety at coal mines. The regulations came into force on December 1st and provide for the following :

1. The searching of underground employees for matches, etc., when required by an Inspector of Mines.
2. That after January 1st, 1916, no safety lamp except an electric lamp shall be lighted below ground except by a competent person appointed for that purpose. No other person shall have in his possession any contrivance for lighting any safety lamp.
3. A definition of the term district or split.
4. Points specified where quantity of air shall be measured.
5. That every ventilating fan be provided with a water gauge and that the manager shall appoint a competent person to observe such ventilating pressure (excepting when an automatic indicator is used) every two hours and record the same in a book kept for that purpose.
6. That the manager of every mine shall keep in the office at the mine a separate plan drawn to a scale approved by the Chief Inspector of Mines, showing the system of ventilation in the mine, the direction of the air currents, the points where the quantity of air is measured and the devices for the regulation and distribution of the air; such plan to be kept up to a date not more than three months previous.
7. After July 1st, 1915, every mine fan shall be arranged so that the air current may be reversed immediately.
8. A competent person shall be appointed, for recording in a book the number of persons going below ground and returning from below ground on each shift.



9. In every mine, unless naturally wet throughout, the cars shall be so constructed and maintained as to prevent dangerous coal dust escaping through the sides, ends or floors of the cars, but any cars in use prior to the passing of these regulations may, notwithstanding that they are not so constructed, continue to be used, in that mine, until January 1st, 1920.
10. No explosive, other than a "permitted explosive," shall be used for blasting coal in any anthracite or bituminous coal mine.

**British  
Columbia**

As the percentage of fatal accidents caused by falls from the roof in coal mines in British Columbia, during the last few years, has ranged from 35 to 60 per cent of the total accidents due to coal mining, Sir Richard McBride, the Minister of Mines, in June, 1913, sent a circular letter to all mine managers in the province, requesting them to submit the method of timbering used at the mines under their charge ; also requesting certain other provisions relating to timbering and asking for their hearty co-operation and suggestions. As a result of this correspondence, a uniform "Special Rule" has been adopted, each colliery having its own method of timbering adopted under the rule to suit local conditions.

The following is the Special Rule :

"(a) The manager of the mine shall cause to be posted at a conspicuous place near the mouth of the mine a notice stating the minimum size of the different types of timber to be used in such mine, and the maximum distance between the timbers and between the timbers and the face and sides of the working-place.

"(b) In the event of two or more methods of timbering being used in one mine, then, in addition to the notice posted at the mouth of the mine, a notice shall be posted at the entrance to each section or district, stating the method of timbering to be used in each section or district of such mine.

"(c) It shall be the duty of the miner in charge of a working-place—which shall include such working-place and for a distance of fifteen (15) feet back from the face—to keep the props, timbers, or other roof supports erected as designated in the 'notice of systematic timbering' governing the mine, division or subdivision of such mine in which he is employed.

"(d) Nothing in this section shall prevent a miner from setting supports or an official from requiring the miner to set supports, in his working-place at more frequent intervals than those specified in the notice aforesaid, where necessary for safety.

"(e) Every miner in charge of a working-place shall set sufficient sprags or other supports for the undermined coal ; provided that before commencing to mine he shall set one (1) sprag or other support, and not less than one (1), for every six (6) feet of such undermining.

"(f) Temporary props shall only be withdrawn by use of a dog and chain or other type of timber-drawing machine, unless permanent timber has been set before such withdrawal, and no permanent prop, timber, or other roof support shall be finally withdrawn without the use of such timber-drawing device."

There is no doubt that the adoption of this rule will prove beneficial and be the means of reducing the loss of life in accidents from fall of roof and coal.

The Chief Inspector of Mines of British Columbia, in the *Report of the Minister of Mines, 1914*, also makes certain recommendations with regard to the maintenance of discipline in coal mines and the use of non-freezing explosives at metal mines.

From the above it can be seen that safety at mines is being carefully studied by this department.

#### IV. FIRST AID AT MINES

Since 1906, *The Coal Mines Regulation Act* of British Columbia and since 1913, *The Mines Act* of Alberta, have required that all underground mine officials hold a certificate of competency from some recognized ambulance association in order that they may be qualified to administer first aid to those injured at coal mines.

In connection with metal mining, although this subject is of equal importance, no such provision exists.

It is not only essential for underground officials at mines to have a knowledge of "first aid," but, owing to the nature of the work, it is necessary for all miners, or as many as possible, to have a knowledge of this important subject. In the case of an accident happening on the surface it is generally only a matter of a few moments before a surgeon and ambulance are in attendance; but in the case of accidents happening underground much time is lost before proper assistance can be had or the injured one brought out of the mine. Again, by unskilful but necessary handling the injured one is liable to become more seriously hurt.

To encourage first aid instruction at metal mines the Minister of Mines of British Columbia has appointed an instructor, who shall establish centres of instruction in first aid throughout the province. In Rossland alone there are over 420 taking this course. To stimulate competition and thus encourage first aid work among miners, the Hon. Louis Coderre, Minister of Mines, has given to the St. John Ambulance Association a silver cup for annual competition among all miners in Canada.

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The Commission adjourned for recess, resuming its deliberations at 2.30 o'clock.

## Preservation of Railway Ties\*

BY

HENRY K. WICKSTEED

*Chief Engineer, Canadian Northern Railway, Eastern Lines*

THE question of a future tie supply for the railways has, for a decade or more, been a serious one in the United States, owing to the rapid depletion of the forests, and within the past five years the anxiety has spread to Canada.

Nearly two years ago the writer became, in the course of other business, acquainted with Mr. Geo. W. McMullen, of Picton, Ont., a man who had made the conservation of waste a life study and who had made wonderfully successful studies in other fields. The conversation turned on one occasion to the subject of the preservation of timber, and in the course of it some facts and theories of extraordinary interest were developed. Mr. McMullen had, in the course of other investigations, become possessed of a fairly complete laboratory and was in close touch with modern bacteriology and practical chemistry. As a result of the acquaintance, experiments of great interest have been made, involving an entirely new process of drying timber, and more especially with reference to railway ties, the supply of which has become, within the last few years, a most momentous question with the railways. More particularly has this become so in Canada, owing to the depletion of the forest and the great increase in railway mileage during the past half decade.

### Average Life of Railway Ties

Assuming the average life of ties, for instance, at six years, the Canadian Northern railway alone will need over four million per annum and the other two trunk roads something more than this, or say from twelve million to fifteen million in all. Our northern forests cannot stand this drain for any length of time, much less can we hope by any reasonable efforts in reforestation to keep abreast of the demand. The timbers used are slow-growing ones, with the exception of jack pine, and even this takes thirty or forty years to attain sufficient size.

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\* As Mr. Wicksteed was unable to be present at the meeting, his paper was read by Mr. Clyde Leavitt, Forester of the Commission of Conservation and Chief Fire Inspector of the Board of Railway Commissioners. Before reading Mr. Wicksteed's paper, Mr. Leavitt pointed out that, as the work of the Committee on Forests had been covered in detail by the Chairman, it would be unnecessary for him to present a further report to the meeting.



There are two means by which we can stave off the impending famine, one by increasing the life of the timber tie and the other by using some other material altogether, such as steel or concrete. Such experiments as have been made in the latter expedient have not been altogether satisfactory from the point of view of economy, even where they were physically.

The first expedient is the only one which has come into any considerable use on this continent and it has usually taken the form of injection of creosote into the pores of the wood. This acts as an antiseptic, preventing the bacterial growth which results in decay through what we are accustomed to call "rot." The creosoting process, while a great advance on the use of raw woods, is by no means a perfect cure ; first, because it is expensive, nearly doubling the cost of the tie ; second, the timber is somewhat weakened in the process owing principally to the high temperatures to which the wood is subjected ; third, to be at all effective the timber should be thoroughly seasoned or dried, and this is hardly practicable by existing means except by the consumption of a large amount of time and space and the locking up of a considerable amount of capital for that time. The Germans stack and air-dry their ties for eighteen months or more, before treatment, and even then do not get a dry tie or perfect product and in America it seems to be seldom that more than one-third to one-half of this time is allowed.

<b>Dry Woods</b> <b>Almost</b> <b>Indestructible</b>	According to notable chemists, dry woods or cellulose are almost indestructible by any ordinary agency such as a tie is exposed to. The bacterial growth requires moisture and oxygen for its development. It would appear, therefore, that if we thoroughly dry a piece of timber, and keep it dry, it will last indefinitely. We know from actual experience that this is so. Everyone has used or seen old timber in the form of beams and joists taken from buildings two or three centuries old and perfectly sound. In these cases moisture has been excluded. Again, every one has seen or at any rate read of piles and foundation timbers many centuries old in a perfect state of preservation. In these cases oxygen has been excluded. We all know that exposed timber will generally last longer when coated with paint or tar or some other waterproofing material. The exceptions are where the timber has been waterproofed before it was seasoned, with the effect of retaining the moisture already in the stick and preventing its evaporation. Timber, even when air-dried for a considerable length of time, still contains fifteen per cent or more of moisture, the percentage varying with the nature of the material and the size of the
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ick.

**Seasoning** Another point not so well recognized or understood  
**Timber Increases** is that seasoning timber increases its strength by as  
**Strength** much as 80 to 100 per cent over that of the green stick. It will be seen at once that, consistently with reasonable expense and loss of time, it is well worth while to dry, not only ties, but timber of any kind used as a beam or strut, where strength is necessary. If we increase the strength by even 60 per cent, we require only 60 per cent of the amount of material, and, as this percentage is dry, while the other contains a very large amount of moisture, the saving in freight is very much more than the apparent 40 per cent. In Eastern Canada, at any rate, transportation is a very large item in the cost of our timber and is compelling us, as a matter of expediency, to use steel and concrete where we should use timber if it were readily available.

It being granted that drying or seasoning is extremely desirable, the question is as to the means. In the case of ordinary lumber, air-drying supplemented by a few hours in a kiln is fairly satisfactory. In that of dimension timber it is not so. First, because the air-drying in the case of large sticks takes years to accomplish ; second, because the temperatures used in the ordinary kiln are so high as to injure the strength of the timber; third, because, even when carried on with the greatest care and deliberation, the outside laminæ dry first and shrink before the heart of the stick has any chance, and this shrinkage causes checks and cracks which, for many purposes, render the stick useless.

When the "wooden walls of England" were a reality, the seasoning of large sticks was carried on by immersion in sea water for a period of three years more or less, the saps and resins were dissolved and washed out, and the pores of the wood left open and filled only by water. The subsequent drying was then easily, quickly and uniformly carried on throughout the stick, and the resultant deposits of salt acted as antiseptics just as the creosote does in the modern process. This was perhaps the most perfect seasoning possible, or ever accomplished. The process was very likely suggested to the English ship-builder by his observation of the condition of logs and driftwood which, after years of immersion, had been cast upon his shores by the Gulf Stream and local winds and currents. The Eskimo knows no other process than this and his woods are very perfect and lasting, but, in these days of rush and hurry, it cannot be expected that anyone will prepare his material three or four years in advance. Probably the excellent reputation which Canadian white pine had with the British Admiralty was largely due to its long

immersion in the waters of the Ottawa and the St. Lawrence before it was finally loaded on shipboard.

**Wash out Sap  
and other  
Liquids**

In the experiments made in the last two years and above mentioned, an effort was made to use the same process that nature does, and dissolve, neutralize or wash out the sap and other liquids or semi-liquids which obstruct and close the pores, and to do this within a reasonable time ; much faster than nature unassisted can accomplish the work. Hot water is more effective than cold water, and hot vapour of water is, in some cases, still more so. In the new process, which is simplicity itself in theory, although the best form of mechanical application took much time and thought to study out, warm vapour, or, in other words, warm air, saturated with moisture, is circulated among the ties. This opens and cleans the pores of the wood just as a Turkish bath does in the case of a man. The saps and resins filling the vesicles themselves, expand with the heat and force their way out, to be diluted and carried away by the warm vapour. After some hours of this treatment, the amount of moisture is reduced by very slow degrees, until, at the end, it is practically dry and the timber is removed with not more than 5 per cent of moisture left in it. The rapidity with which this is done depends upon the size of the sticks and the nature of the timber, just as it does in other methods, but no subject has yet been found which did not, in the end, yield to treatment. Care is taken not to let the temperature of the kiln get above 160° F., so that no injury may be done to the fibre of the wood.

**Coating to  
Exclude Moisture**

Timber so treated is, we believe, indestructible, except by fire, so long as it is kept dry. Even without further treatment, it will undoubtedly long outlast unseasoned material. It is, in this shape, in pre-eminently good condition to receive creosote, but we believe that creosote is absolutely unnecessary and that the elements of decay being altogether removed from the inside, all that is necessary is to keep them from entering from the outside. Some waterproof coating is desirable and, in the case of ties, a cheap one is the only one which can be economically used. In the experiments so far conducted, a heavy asphalt was found, which answered the purpose perfectly and which is an almost worthless by-product of the refineries. The ties are merely dipped in a hot bath of this material for a few minutes and, on coming out, are sanded by a sand blast to absorb any superfluous stickiness and make them easier to handle, just in the same way as an asphalt road is sanded. Timber for building, where neat joints and carpentry are required, would probably be better treated



with some pigment mixed with oil or varnish, but, for rough work, the asphalt or mineral tars seem to be all-sufficient and very inexpensive. The estimated cost of the drying process is seven or eight cents ; of the protective coating three or four cents a tie. Taking the higher figures and adding a margin, it would appear that fifteen cents will cover the total cost.

**Increases  
Supply of  
Tie Timber**

The prospect which is opened up by this process is something more than merely getting the equivalent of the process-creosoted tie at a less cost. It is, besides, the potentiality of using for ties, timbers which are now useless for the purpose, or nearly so. The northern birch, for instance, is a strong reliable wood, used by the Indians for every purpose requiring a hard wood, but unavailable for ties or bridge timber on account of its superabundant sap and its tendency to rot rapidly. The poplar and the balsam are others for which there is at present practically no demand. These timbers are particularly interesting to us just now on account of the recent opening up by the railways of thousands of square miles of northern forests, of which, with spruce and jack pine, these are the main constituents. The use of these woods for commercial purposes means not only millions of dollars to the railways in reduced cost of ties and in freight, but more millions to the people of Canada who have been burning up and wasting this forest growth as something not only worthless, but as actually impeding settlement.

**Conserve the  
Northern  
Forests**

It is quite conceivable, I think we may say probable, that the settler in New Ontario or Northern Saskatchewan or Alberta, will find it profitable to conserve the forest on a considerable portion of his land, cutting from year to year only the mature timber so as to encourage the young growth. Aside from the question of ties and pulp wood, what a large potential value there is in poplar, balsam and spruce ! In Winnipeg's early days, poplar lumber was the principal material in house building and there was no fault to be found with it, except its shrinkage, which drying would have prevented.

Balsam is, to this day, the principal cut of the little country mills in northern Nova Scotia for home use, and is an excellent material for inside carpentry. Spruce is the finest material for spars, probably of any known, and only its perishability prevents it from making a cleaner, straighter and stronger telegraph pole than the crooked twisted cedars we are using. Birch is already coming to its own in the manufacture of furniture. Our northern settler has been in the habit of burning up most of these timbers as almost worthless, in order to grow potatoes in their stead. A century ago, the settlers

in Western Ontario thought much the same about the white pine and the black walnut and some of the wealthiest residents in that portion of the country to-day are those whose fathers either by accident or design left some of the original forest standing.

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**Experts on  
Preservation  
Consulted**      MR. LEAVITT : In order to secure expert opinion on the matter we forwarded a copy of this report to the Dominion Forestry Branch and also to the Forest Products Laboratory at Madison, Wisconsin, where they also have experts who have gone into the matter of wood preservation with the greatest care. The laboratory at Madison is a part of the organization of the United States Forest Service and has an international reputation. This morning we have received a telegram from the Director of the Forest Products Laboratory at Madison commenting on this proposition of Mr. Wicksteed's, which I shall read, and then, if there should be time, further discussion might be advisable.

Madison, Wis., January 18, 1915.

CLYDE LEAVITT,  
Forester, Commission of Conservation,  
Ottawa, Ont.

Your letter January 15. It has not been demonstrated that kiln drying appreciably increases durability of timber which is to be exposed to the elements ; dry timber will re-absorb moisture if exposed and establish conditions favourable to decay. Temperature of 160 degrees F. even for several hours can not be depended upon to sterilize the wood. Dipping in crude oil may retard, but will not prevent re-absorption of water or entrance of decay, since untreated wood will generally soon be exposed by splitting, abrasion and mechanical wear. To prevent decay it is generally important to put something into the wood which will poison it for fungi.\*

H. F. WEISS,  
Director, Forest Products Laboratory.

This opinion has been confirmed by Dr. J. S. Bates, Superintendent of the Forest Products Laboratories of Canada, recently established by the Dominion Forestry Branch at McGill University,

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\*Since the Annual Meeting this telegram was submitted to Mr. G. B. McMullen, who wrote as follows :

With respect to the criticism by experts from the Forests Products Laboratories at Montreal and Madison with regard to the following points :

1. The efficiency of the waterproofing ;
2. The sterilization of the wood at 160° F. ;
3. The splitting of the wood after water-proofing ;

We would answer as follows :

1. Our waterproofing is in no sense an oil, but a very heavy asphalt—melting point running from 150° F. to 225° F., as found necessary ; flash point 650° F. to

in co-operation with the university authorities. Dr. Bates states that two of his experts in wood preservation have recently inspected the process described by Mr. Wicksteed. It appears, from this investigation, that the drying process referred to, requires about one month for railway ties. The principle of the drying process appears to be correct. However, these experts are of the opinion that, so far as a final preservative treatment is concerned, present knowledge does not lead to the conclusion that a dipping process with asphaltic oil would effectively waterproof the ties or protect them against fungus attack. No doubt the treatment would do some good, but it is not considered likely that it would take the place of ordinary impregnation with creosote. It will be noted that these opinions are in substantial accordance with those expressed by Mr. Weiss in the telegram I have just quoted.

To quote a brief report by Dr. Bates on this subject :

"Some months ago the attention of the Forest Products Laboratories was directed to a method of artificially seasoning and waterproofing timber, developed by Messrs. McMullen, and intended primarily as a protection against decay.

"Briefly the process is based on the fact that dry or practically dry wood is immune from fungus attack. The proposed treatment includes : (1) A thorough drying of timber by artificial means to a

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750° F. It will not be absorbed by the ballast, neither will it melt nor run off with the heat of the sun, nor can it be knocked off by repeated blows of a hammer. The most accessible point for the entrance of fungi is the spike hole. We have found that by boring a  $\frac{3}{8}$  in. hole, filling it with asphalt and driving in a warm spike (a) the entire hole is completely waterproofed and (b) to start a spike driven in dry wood in this manner, requires from two to four times the force ordinarily required to draw a spike. This extra holding power we attribute to the increased strength of dry wood in addition to the gluing qualities of the asphalt. An actual force of 3,250 lbs. was required to draw a spike driven into a dry birch tie in the manner above described.

Tests made by pressing sharp stones to the depth of an inch in such a coated tie showed that the asphalt was of such an adhesive character that it still almost completely waterproofed the break made by the stone. These experiments warrant our faith in the permanency of this waterproofing under ordinary track conditions.

2. It is well known that an intermittent treatment of above 140° F. in a saturated atmosphere, for several days, will destroy all growing vegetable life. We believe that a treatment at 160° F. for several weeks in such a saturated atmosphere as we use, will completely sterilize the interior of the wood. Nevertheless, as an additional safeguard, we introduce formaldehyde vapour for 24 to 48 hours, which will insure the complete destruction of all forms of vegetable life. In addition, the formation of non-volatile paraldehyde from formaldehyde under such warm, moist conditions, leaves a small permanent germicide in the wood which is practically insoluble in water.

3. Since there is less than 8 per cent of moisture in wood dried by our process, there is no tendency for the wood to check. Therefore, there can be no rupture of the waterproofing from internal distortion. The increase in strength of from 80 per cent to 200 per cent in the dry tie, over the green, gives the tie a very high resistance to outside rupture. Since we find it necessary to break the wood to remove the waterproofing, we believe that no ordinary outside abrasion will cause any serious leakage into the tie and that the dry, sterilized interior, containing the germicide above described, will be safe from any growth of fungi.



point at which the moisture content is considerably lower than the minimum attainable by air seasoning ; (2) a superficial waterproofing with an asphaltic material for the purpose of preventing any absorption of water when timber is exposed to excessive moisture. The originator of this process claimed that the method of treatment was applicable to many forms of structural timber, but believed that it was particularly well adapted for the preservation of railway cross-ties. An experimental drying kiln was installed at Picton, Ontario, and considerable experimental work was carried out, using several species of commercial Canadian woods. In January of the present year two members of the staff of the Forest Products Laboratories visited Picton for the purpose of securing additional information regarding the process. The drying kiln was not in operation at that time, but the principles and construction of the kiln were demonstrated by Mr. G. B. McMullen.

"The object of kiln-seasoning is to secure a practically dry timber, without checking or warping due to uneven or rapid drying. The essentials of operation to secure the result are : (1) A thorough warming of the timber in a saturated atmosphere at a temperature of 130° to 140° F., during which practically no drying of the timber takes place. (2) A gradual reduction of the humidity of the air within the kiln, permitting evaporation of the moisture contained in the timber. Perfect control of conditions within the kiln is necessary in order to avoid checking of timber.

"The experimental kiln as developed by Messrs. McMullen consists of a chamber approximately 20' by 20' by 8' wide. An open rack or floor in the upper portion of the chamber carries the timber. Heating coils are placed in the bottom of the kiln and air is circulated through the chamber by means of a fan placed outside the kiln. The air is drawn from the upper portion of the chamber and is delivered in the chamber below the steam coils. The arrangement of air ducts is designed to give practically uniform circulation of air in all portions of the kiln. Water trays containing submerged steam coils are placed in the bottom of the kiln, providing a means of maintaining a saturated atmosphere during the preliminary stage of operation. The admission of exhaust steam may also be used as a supplementary means of humidifying the air within the kiln. The temperature during the preliminary warming stage is maintained at about 135° F., and in the description included with Messrs. McMullen's U. S. Patent No. 1,125,862, it is stated that circulation of air during this period is not desirable. The time required for this preliminary heating stage varies with species, size and condition of timber, but apparently with green railway ties this period ranges from one to two days. The circulating fan is then started, the humidity is reduced gradually and the temperature maintained at about 160° F. Humidity is reduced by draining the evaporating trays and opening a small outlet on the fan delivery line, permitting the escape of a portion of the moist air. The relative humidity of circulating air within the kiln is reduced gradually from saturation to about 60 per cent. The rate of air circulation used in the experimental kiln

is such that the entire volume of air passes through the fan  $2\frac{1}{2}$  times per minute. Apparently the time required for complete drying of railway ties is from three to four weeks.

"This method of drying developed by Messrs. McMullen apparently gives excellent results. Specimens of dried timber—birch, hemlock, etc.—were seen at Picton, which were quite free from any evidence of checking or warping. The Forest Products Laboratories have no record of any determinations of moisture content of such kiln-dried wood as it comes from the kiln, but is probably somewhat less than half that of ordinary air-dried timber. Dried timber allowed to stand in a damp atmosphere will, of course, take up moisture to some extent.

"The second stage of the process involves the waterproofing of the dried timber with a suitable asphaltic material. The originators of the method have had in mind a petroleum asphalt of suitable melting point and consistency. A number of small specimens of wood treated by immersion in this material have been received at the Forest Products Laboratories, but no experimental work has been done here to determine the waterproofing value of the asphalt.

"The claims made for the process are :

1. It will serve as a protection against decay by maintaining timber in a practically dry condition.

2. By reduction of moisture content the mechanical strength of timber is very considerably increased.

3. It will permit the use of species which ordinarily are particularly susceptible to fungus attack or of low mechanical strength in ordinary air-seasoned condition.

4. It will considerably reduce transportation costs on the distribution of timber from the drying kiln.

"While the minimum limit of moisture content of wood necessary for the support of fungus growth has not been exactly determined by any comprehensive experimental investigations, H. F. Weiss suggests 20 per cent as an approximate figure.\* Another authority sets a safe limit for all species of fungi as 10 per cent. Evidently if wood could be maintained in service conditions with little or no absorption of water after kiln drying, it would be absolutely protected from destruction by such agencies. Apparently the practical value of this proposed treatment depends largely on the waterproofing process. Considering the matter of railway cross-ties only, it might appear questionable whether any superficial waterproof coat would stand up under the severe conditions of service imposed upon ties. Abrasion by ballast, tamping tools, picks, etc., and cutting under rails or tie plates might discount the value of the waterproof treatment. It is claimed in this connection that since the bottom and sides of ties covered by ballast are ordinarily much less liable to infection by fungus growths, than surfaces exposed to the air, abrasion by ballast would not necessarily greatly reduce the value of the treatment. It has further been suggested that the waterproof coat on the exposed surfaces of ties might be renewed from time

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\**Preservation of Structural Timber*, H. F. Weiss.

to time by an application with a brush, but the adaptability of such method to service conditions is open to question. The penetration of melted asphalt into wood treated by brief immersion is exceedingly slight, but it is possible that a heavier and more durable covering could be obtained by successive immersions.

"The claims of the originators of this process as to the increased strength of dry timber are quite in accordance with well established facts. The significance of this point might not be so great in the case of cross-ties as with other forms of structural timber, but is worthy of consideration.

"Considering the applicability of this process to other forms of structural timber which are exposed in service to excessive moisture and consequent danger from fungus attack, it would appear that the method might have a considerable field of use. There are certain classes of industrial buildings, paper mills, tanneries, textile mills, etc., in which conditions are particularly favourable for fungus development. In general, oil preservatives, including creosote, have been regarded with some disfavour for the treatment of timber for building construction because of increased fire hazard, except when the possibility of fire developing is very remote. However, this objection might not apply to a superficial coating of a petroleum asphalt. This method might also have a field in the treatment of bridge and trestle timber and in other outside railway structures.

"The question of cost is, of course, of fundamental importance, and the Forest Products Laboratories have no definite information on this point beyond a preliminary estimate prepared by Messrs. McMullen. In Mr. Wicksteed's paper outlining this process, the cost of treating a railway tie is estimated at 15 cents. Accepting this as an approximate figure, it may be noted that it is somewhat higher than the cost of "Burnettising" a tie; about equal to the cost of a combination treatment with zinc chloride and creosote, and, of course, very considerably lower than a full creosote treatment.

"In conclusion, it may be said that the value of the treatment as a means of cross-tie preservation, will depend very largely on the permanency and waterproofing qualities of the superficial asphalt coating. The results of tests of waterproofed ties under actual service conditions will afford definite information as a basis of a judgment of the merits or weaknesses of the process. Preliminary service tests would not necessarily extend over a period equal to the ordinary life of a tie, that is, several years. Examination of the condition of the timber after some months or a year would furnish a fairly reliable index of ultimate results.

JOHN S. BATES,  
*Superintendent."*

SIR CLIFFORD SIFTON: It was about two years after our Commission was inaugurated, before we found a suitable man for Forester, but I think we will all agree it was worth waiting a couple of years to get the services of Mr. Leavitt. I cordially testify that not only as a Forester, but as an official who requires to exercise the greatest tact and judgment in the variety of public men and insti-



tutions to be dealt with, that he has been most efficient and has performed useful services. It would have been quite impossible, in my judgment, for us to have made a happier selection for that important office.

**Railway Fire Protection** You will remember that when we first talked about fire protection it was supposed that we were talking a good deal at large and that it was going to be difficult to get anything practical done. I remember myself, very distinctly, that, when the suggestion was made that we should go to parliament and secure legislation to provide that the railway companies should be placed under the law, and be required to carry out a system of fire protection, it was looked upon as a huge joke. It was supposed that the railway companies would make such opposition in parliament that we would never have a chance of getting the legislation through.

**Co-operation of Railways** I had a good deal of faith in the success of the project myself, and, much to the surprise of a great many of those who took a pessimistic view, when we came before the Minister of Railways and Canals and made our proposition, the representatives of the railway companies did not manifest any very strong opposition ; in fact, they showed a disposition to co-operate. When we had made some progress and had secured the legislation, so that the Board of Railway Commissioners were authorized to formulate plans and promulgate regulations which the railway companies would be required to observe, again, the railway companies sent their representatives and endeavoured, loyally and faithfully and honestly, to assist in getting out a set of regulations that would be effective for the purpose intended. Instead of finding ourselves antagonistic to the railway companies and providing regulations for them, difficult to enforce and frequently ineffective even when enforced, we find that the railway companies to-day are our most active coadjutors and most willing assistants in the great work of fire protection. This, I think you will admit, is a very happy and very desirable condition of affairs.

## Fire Protection from the Standpoint of the Railways

BY

A. D. MACTIER

*General Manager, Canadian Pacific Railway, Eastern Lines*

**B**EFORE I proceed to read some of the notes that I have prepared I would like to take the opportunity of endorsing, from the point of view of the Canadian Pacific railway as far as I know it on the eastern lines, the Chairman's remarks with regard to Mr. Leavitt. I do not mean to say for a moment that Mr. Leavitt and I have always seen eye to eye. My memory carries me back to one or two occasions when we did not ; but I will say that Mr. Leavitt has tried, or at least he has been clever enough to give me the impression that he tried, to be fair about the propositions, and that, I think, is all the Commission desires of him.

The realization and appreciation of the value of the Canadian forests has brought to our attention the necessity of their conservation, through fire protection. There is also the growing realization that only through proper handling will forests reproduce themselves ; and the vital factor in conservation is the elimination of the causes which result in the enormous damage done by fire. No other agency has affected the growth of Canada's forests as has fire. Various statistics show that the amount of timber destroyed by forest fires has been from two to five times the value of that used for commercial purposes.

### **Railways and Forest Fires**

For many years practically all fires, and the resultant damage, were attributed to the railways.

In the reports showing "causes of fires" railways were always at the top, and led the rest by a wide margin. This analysis was not combatted by the railways, and little attempt was made to show the relative amount of damage done by fires caused by different agencies. Any indifference on the part of railway officials and employees, which may possibly have existed years ago, has been eradicated, and the attitude to-day of those responsible for the management of the Canadian Pacific railway is entirely different.

To enable a proper diagnosis of the railway fire situation to be made, a study was made of the fires which occurred on or within five miles of the Canadian Pacific Railway Company's lines during the

fire season of 1914. The results show that, of the fires reported, sixty-five per cent started on, or along, the company's lines within the 600-foot liability zone. Of the fires which had their origin on, or near, the rights-of-way, more than ninety-five per cent were immediately put out without having caused any damage. In only one case of absolutely known company origin was any material damage occasioned outside of the rights-of-way. This was caused by sectionmen burning *débris* and refuse when the weather conditions were unfavourable. All fires within the zone of the railway company's responsibility were extinguished, regardless of whether started by the railway or not.

**Rights-of-Way  
Used as Highways** It must also be remembered that, in the more thickly wooded districts, and in those sections where settlement is more or less scattered, the railway rights-of-way are used as highways by farmers, settlers, hunters, fishermen, and others, who travel back and forth constantly. Then too, the tramp nuisance is always with us. These people have the reputation of being extremely careless, and there is little doubt that to this carelessness may be traced the origin of many fires on the railway rights-of-way.

The remaining thirty-five per cent of reported fires were started outside of the 600-foot zone, and away from the railway rights-of-way, their origin being due probably to the carelessness of settlers, lumbermen and others, and were in very few cases handled by any local bodies or by forest rangers. No Government organizations exist apparently to handle fires which occur in the districts now being settled, and which are situated immediately between our lines and vast bodies of merchantable timber.

Two examples of these fires may be cited : On or about May 18th, 1914, a fire was started three miles north of the track in the direction of Blind river, near mileage 52—Algoma subdivision. This fire caused a loss of over \$20,000 as shown by the owners. There is little doubt but that this fire had its origin along a river driver's trail. The timber holders themselves put it out, but at an excessive cost.

On the same day, May 18th, 1914, another fire was started by a farmer, near Campeau, on the Laurentian subdivision, to burn some brush. The fire got beyond his control and did a tremendous amount of damage. Our section-house at Campeau was destroyed, together with the household effects of the sectionmen's families. The appraisal of the loss has not yet been received. Rain alone put this fire out, though we endeavoured to protect our property.





ALGOMA CENTRAL RY. RIGHT-OF-WAY NEAR HEARST, ONT.  
Unusually well cleared for a newly constructed line.



RIGHT-OF-WAY CLEARING. AN IMPORTANT ASPECT OF RAILWAY FIRE PROTECTION  
It is doubly important in the vicinity of wooden trestles, which, if burned,  
might cause accidents or serious traffic delay.



The activities of the Canadian Pacific Railway Company in providing for fire protection along its lines may be briefly summarized as follows :

1. All inflammable *débris* and brush have been cleared from the rights-of-way and the company's property. This not only reduces the possibilities of fires getting started, but it also assists in retarding their progress, in case a fire is started.

2. A system of inspection of front ends and ash-pans of locomotives guarantees the maintenance of this equipment up to standard specifications. This inspection, which is very thorough, reduces to a minimum the possibility of fire from locomotives.

3. Engine employees are not allowed to drop live coals, ashes and fire, except in specially provided pits. Care must be taken with burning and smouldering waste.

4. Special authority is required from the roadmaster before burning is allowed on the rights-of way.

5. Regular patrols are provided in the thickly wooded districts. These men constantly patrol their districts, keeping close watch over the company lines, as well as adjoining lands. Special patrols are added in certain districts when droughts occur.

6. All sectionmen, extra gang-men, trainmen, bridge-tenders, track-walkers, etc., are constantly on guard against fire.

7. Fires of any magnitude are immediately reported to the superintendent, who makes provision for their handling. The local inspector of the board is notified if a fire threatens to cause any considerable amount of damage. The superintendent also advises the local provincial fire officer.

8. On sighting a fire, engine-men must notify the next section-gang passed of its existence, by a series of whistles. This section-crew will immediately go to the scene of the fire, and use every effort to put it out.

9. A system of inspection of patrols furnished, takes place regularly.

10. By bulletins, supplements and by letters, a campaign of education is carried on among officers and employees, with the idea of making clear the importance of reducing the fire loss.

11. Lumbermen and other timber-owners have been requested to clear up *débris* and slash adjacent to the company's rights-of-way.



As has been already mentioned, in spite of an unprecedentedly long, dry season following immediately after the snow had disappeared, the results of our fire-prevention service for the past year show that but one fire proven to have originated on the property of the railway company, got off the right-of-way and did any considerable damage. We are, however, settling some claims where our records are not good, and our liability, therefore, doubtful, and we have yet one large claim in dispute.

**Difficulties to  
be Overcome**

The condition of the country which adjoins the company's lines, caused by frequent fires, lumbermen, road-builders, etc., renders difficult any system of economical fire-fighting, after a fire is once under way. Slash and *débris* have been allowed to accumulate for years, and no attempt has ever been made to handle it. Timber properties are being logged by the same methods that have been in use for years. Every attempt at legislation along this line has been fought off by settlers and lumbermen ; the claim has always been that the lumber business could not stand the extra expense necessary to pile or burn brush. This hardly seems justified, in the face of the increasing value of stumpage accruing to the Governments concerned.

**Settlers'  
Responsibility**

Much of the work of forest fire prevention is in the hands of the settlers of the district. That they may accomplish this object two precautions are necessary. First, it is necessary that they use judgment in the time at which to burn the slash which has accumulated through clearing of property. Laws relative to this have been almost entirely disregarded in the past. Until 1914, notwithstanding that the existing laws were broken, prosecutions were rarely attempted. Fire protection associations, which are composed mainly of timber-holders, have done much more in this regard than any local government has.

Secondly, as the prosperity of many villages is tied up in the local lumber industry, this fact should be made plain to the surrounding settlers, and local organizations could be developed in the villages to fight fires. Some such system is now being devised in the state of Maine. In all villages within forest districts a small fire-fighting equipment should be kept in a convenient place. The police officer should also be an authorized fire warden and should take charge in case of fire.

**What the  
Lumberman  
Can Do**

The fact that logging operations are usually over in the spring and do not start until autumn is generally advanced to show that lumbermen are rarely responsible for forest fires. However, driving operations continue all through the spring and into the summer months, and it has been

absolutely proven that a number of the damaging fires in 1914 were started by men engaged in this work. Smudges are set out and small noon-day camp fires are made, which, unless carefully extinguished, are likely to cause trouble.

During extreme droughts men should not be allowed to smoke in the woods. This will not entail any great hardship ; it is already required of many wood-surveying parties. Where timber properties adjoin railways and highways, a strip of from one hundred to one hundred and fifty feet should be cleared on either side. Lumbermen should also educate their employees to the importance of fire protection of timber.

Small villages, which are situated in timber areas, and, consequently, in immediate danger from forest fires, should insist upon the clearing away of the *débris* and brush by which they are surrounded, and which constitute such a serious fire menace.

**What Can  
Governments  
Do ?**

It is necessary that the fire danger zone be localized and a definite and effective remedy be applied to the fire menace.

It is recommended that a proportion of the amount annually appropriated for forest fire protection purposes should be put into permanent improvements, such as telephone lines, trails and lookout stations. High points along the Laurentian mountains, especially in the vicinity of Mont Laurier and Nominig, connected up with the local villages, would prove a good investment. This policy is now being pursued by the Provincial Government in British Columbia, also in the western forests of the United States and in portions of the New England states. The state of Maine has a very fine system of lookout stations on the high mountains along the Canadian Pacific Railway Co.'s lines.

On the Ottawa river, near Timiskaming, exceptional advantages are offered for the location of lookout stations. Telephone lines could be constructed and maintained cheaply. Timber-lands are made accessible by the splendid water routes there, and mobile fire-fighting equipment, such as that provided by gasolene boats, could be brought into service.

The following legislation, which forces property holders to clean up their premises, is on the statute books in Minnesota, and similar legislation is to be attempted this winter in the state of Maine :

"Where and whenever in the judgment of the State Forester or District Ranger there is or may be danger of starting and spreading of fires from slashings and *débris* from the cutting of timber of any kind and for any purpose, the State Forester or District Ranger shall order the individual, firm or corporation, by whom the said timber

has been or is being cut, to dispose of the slashings and *débris* as he may direct. Where conditions do not permit the burning of the slashings and *débris* over the entire area so covered, the State Forester may require the person, firm or corporation by whom the timber was cut, to dispose of such slashings and *débris* in such a way as to establish a safe fire line around the area requiring such protection, the said fire line to be of a width and of a character satisfactory to the State."

"When any person, firm or corporation shall have been notified by the State Forester or *District Ranger* to dispose of slashings and *débris*, either by entirely consuming the same or establishing a fire line sufficient for the protection of adjoining property, and fails to comply with such instructions, the said person, firm or corporation shall be deemed guilty of a misdemeanour, and on conviction thereof, shall be punished by a fine of not less than *fifty dollars* (\$50.00) and not exceeding *one hundred dollars* (\$100.00) and costs of prosecution for each violation thereof or failure to comply therewith."

While the railways in the past may have been to blame, at the same time, they have done a very considerable amount of fire protection work. I believe it is now the duty of some one else to assist in the work, and it is really that point which I wish to bring out, namely : that somebody, possibly the Conservation Commission, should be able to bring pressure to bear in some direction on the governments interested to continue the work which has been started and of which we (the Canadian Pacific Railway Co.) think we have done our portion so far. I do not say that we are perfect ; I do not believe we are ; but I think we are ahead of some other interests in connection with fire protection.

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SIR CLIFFORD SIFTON : I am sure we have been very much interested in listening to Mr. MacTier's remarks, which are from the standpoint of a practical business man ; and knowing the sacrifice of time and convenience at which he comes, I think I am quite within my rights in assuming that I speak the sentiments of the meeting when I extend to him our very hearty thanks for coming here to address us.



## Administration of the Agricultural Instruction Act

BY

C. C. JAMES, C.M.G., LL.D.

*Agricultural Commissioner, Department of Agriculture*

**M**R. CHAIRMAN, ladies and gentlemen : Owing to pressure of other important work, I am compelled to speak to you this afternoon from notes, instead of presenting a written paper.

First, let me say a word or two in regard to *The Agricultural Instruction Act* which was passed two years ago. The Dominion Government, in 1913, on the advice of the Hon. Martin Burrell, Minister of Agriculture, appropriated \$10,000,000 to be expended during a period of ten years, giving an average of \$1,000,000 a year. For the first year, 1913-14, \$700,000 was set aside ; for the second year, \$800,000; for the third year, \$900,000, and so on, until, in 1917, we shall reach a maximum of \$1,100,000, unless, meanwhile, as some of us hope, the Government, in its wisdom, should see fit to add to that amount. Whether such an increase would be justified may perhaps be determined to some extent when I conclude this statement with regard to the chief expenditures of the money in the last two years.

### **Purpose of Appropriation**

This money is set aside for the purposes of "education, instruction and demonstration." As, under the *British North America Act*, education is a prerogative of the provinces, and is something in which the Dominion Government is supposed not to interfere ; this money is handed over to the various provinces to be expended through their Departments of Agriculture and Education. The Dominion Department of Agriculture does not dictate as to the expenditure of the appropriations. Our relationship to that work is that of aiding it in an advisory capacity, and supervising the work, and I can only say that the utmost harmony has prevailed in the relationship of myself, representing the Minister, and the various Provincial Departments.

**Basis of  
Division**

The basis of division among the provinces was as follows : First of all we set aside \$20,000 a year for two veterinary colleges ; one in Toronto, affiliated with the University of Toronto, for English-speaking veterinary students ; and one in Montreal, affiliated with Laval University, for French-speaking students. As these colleges provide instruction for all the provinces alike, without any distinction, we thought that they should be specially taken care of. There was another reason also : the Dominion Department is continually demanding trained men for Dominion services, both for the inspection and protection of live-stock ; and also for the inspection of meat, in connection with abattoirs and slaughter-houses. The value and importance of these two colleges are being recognized more and more. Just at the present time the Department is confronted with a request from the British authorities to supply them with trained veterinaries and the officials are quite unable to do so.

Then we give \$20,000 to each province, irrespective of population, area, or natural production. The balance of the year's appropriation is divided *pro rata* according to population. If we had divided the money solely in proportion to population, Prince Edward Island would have got last year a little over \$6,000. On the top of that, however, the Government places \$20,000, so that, while we take a small amount away from the larger and richer provinces, we materially increase the resources of the smaller provinces. This plan seems to have worked quite satisfactorily.

Now a few words as to the expenditure of the money in the various provinces—and, if what I say should, at times, appear to have too much of a personal note, if I have to use the word “I” frequently, it is because of the way in which the subject is presented. My report, now completed, and in the press, is more formal and describes the work in more detail.

**AGRICULTURAL EDUCATION IN PRINCE EDWARD ISLAND**

Prior to 1912, Prince Edward Island had practically no agricultural organization. There was a Commissioner of Agriculture who was also Provincial Treasurer and Provincial Secretary. He had an assistant known as the Secretary for Agriculture. The Department then consisted of one man, Prof. Theodore Ross. The agricultural instruction work on the Island was done by the Dominion Department of Agriculture. The chief work looked after by the province itself was the appropriating of funds for the holding of annual exhibitions in Charlottetown and other places. Last

year, however, \$26,529 of Federal money fell to the lot of Prince Edward Island. This is increased every year by \$1,306 until in 1917 the amount will be \$31,754.

**Outline of Organization** What has been done with that money ? First of all it was necessary to have offices and a lecture hall, and an agricultural hall was secured in Charlottetown in which meetings can be held, and demonstrations can be given. At the present time two or three hundred students, young men, middle-aged, and even old men from the Island farms are gathered there receiving instruction in various lines.

On the Island there is a college known as Prince of Wales College. At various times the Secretary for Agriculture found opportunity to give instruction to students in attendance at this college on nature study and agriculture; but, with this Federal grant at the disposal of the province, the college was enabled to at once establish a definite and complete course in agriculture and two teachers were appointed, Prof. Davidson, instructor in agriculture, and Prof. Reid, instructor in live-stock. Since these regular courses have been established, classes have been carried on, some for short terms and some for long terms ; so that students can now go to Prince of Wales College and get a course in agriculture, including live-stock, field-crops, dairying, etc., just as others get instruction in languages and in the natural sciences.

**County Instructors and Women's Institutes** In addition to college courses in agriculture, last year, for the first time, the Provincial Government introduced the practice, copied from Ontario, of having county instructors, and the three counties of the Island were placed in charge of three departmental officers. The business of these men is to keep in touch with the farmers and their methods, to advise, direct, and assist in every way possible. The next step was the organization of Women's Institutes on the Island. These are in a very flourishing condition and they are growing, as in the other provinces, much more rapidly than any of the men's agricultural organizations.

Again, the teaching of nature study and agriculture has been undertaken in the public schools. Courses are held at Prince of Wales College during the summer, in which special instruction in these subjects is given the teachers, and all the public school inspectors, who are under the direct supervision of the Government, have inaugurated a system of school gardens and competitions for boys and girls at a very small cost to the province.

The result is that, instead of having only a Secretary for Agriculture as before, the Provincial Department now has a permanent



staff of five instructors and carries on work along many lines. At the same time the Dominion work has not been slackened. There is going on at the present time on the Island an agricultural movement that would surprise the other provinces of Canada. Prince Edward Island is one province in Canada that has yet to learn that we have been passing through hard times for the last two years. It is an island of farmers alone. All these movements have been taken up in a whole-hearted way, the Provincial and Dominion officials co-operating most thoroughly, and among the things contributing to their improvement we can truly state that the expenditure of this Dominion money has formed a very important part. To assist in administering the Act, a permanent staff of five persons has been organized to assist the Secretary, and in March, 1915, Prof. W. R. Reek, B.S.A., of the Ontario Agricultural College, will take office in charge of the general instruction work provided through the Federal appropriation.

#### PROGRESS IN AGRICULTURE IN NOVA SCOTIA

In Nova Scotia the Federal grant started at \$54,288, and an annual addition of \$6,858 will bring this, in 1917, to \$81,719. There is a peculiar situation in Nova Scotia. The principal of the agricultural college at Truro is also Provincial Secretary for Agriculture, so that the agricultural life of Nova Scotia is centred, not in Halifax, but in the beautiful little town of Truro. There is the normal school, there is the agricultural college, and there are the headquarters of all the provincial agricultural officials.

We began in Nova Scotia by strengthening agriculture right at its fountain head. At Truro there was an agricultural college doing good work under Principal Melville Cumming, but it was sadly handicapped for buildings, equipment, and men. The first thing done was to set aside a substantial sum for enlarging the one college building they had. To-day they have a college main-building twice the size of the old institution. In addition to that, a horticultural building has been erected, with full equipment also for the carrying on of entomological work; and the foundation has been laid and the walls are almost completed for a new science building. They have not enough money in this year's appropriation for the science building but they have borrowed the money to put the building up, and are going to take out of the Dominion appropriation a certain amount each year to liquidate that debt, paying off the principal and interest during the continuance of this Act.\*

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\*Additional buildings much needed are a residence for students and a building for domestic science.

Before receiving assistance from the Federal grant the staff of the college was insufficient. One of their staff, for purely personal reasons, resigned his position and Principal Cumming of the college, in 1913, was looking for another man. Salaries in the East are not as large as they are in the West; he could not find the man he wanted, at the old salary, so he wrote to us and said: "I think we can get the right man, if you will allow us to use some of the Federal grant to pay the higher salary; he is a Canadian, doing good work in the United States." We sent back word: "Get the man, and draw upon the Federal grant." Prof. Trueman is now in charge of the work of instruction in field-crops and live-stock in Nova Scotia, and he is looked upon as one of the most valuable men in agricultural work in the Maritime Provinces. We believe that it pays to get the best men available.

**Teaching  
Agriculture in  
Schools**

I stated a moment ago that the normal school is at Truro, not very far from the agricultural college.

The next thing was to appoint a Director of Rural Education. Mr. L. A. DeWolfe, B.A., was appointed, and he was attached to the staff of the normal school. He instructs the teachers-in-training in agriculture and nature study, and has a general supervision of the work throughout the province. I had an opportunity last year of visiting the fall fair at Musquodoboit, and there I met Mr. DeWolfe and the county school inspector, Mr. Creighton, and some twenty teachers who were holding a convention, comparing notes, acquiring new information and fresh enthusiasm. There were two fair buildings, one of which, the county demonstration building, was provided for out of the Federal grant. In these were to be seen the exhibits in competition from the pupils of the schools. On the grounds outside were the coops of poultry grown from settings of eggs distributed early in the year.

The result is that not only have some strong men been retained in the province, through increasing their salaries out of the Federal appropriation, but additional instructors also have been appointed. The trouble hitherto has been that the Government with the longest purse was able to get the best men, with the result that the smaller provinces, being unable to pay the higher salaries, were losing their most efficient men. I think we can fairly say, that one result of the Federal grant has been to largely put an end to that, and that it will now be found that the men that are in the work in New Brunswick, Prince Edward Island, and Nova Scotia, are as able as any that are in the West. They have been retained there because the provinces have been enabled to give them salaries commensurate with the work required of them. Permanency and stability are essential to the best results.

*The Agricultural Instruction Act* has made it possible to create five permanent offices of instruction in this province. Further, the Women's Institute work has been encouraged and is now carried on entirely with funds from the Federal grant.

#### PROGRESS IN NEW BRUNSWICK

The initial grant to New Brunswick was \$44,509 with an annual addition of \$4,902, which, in 1917, will give that province a Federal grant of \$64,118. During my first visit to New Brunswick I met the premier, who remarked to me that there were a couple of men in the town of Woodstock who were in a great quandary. They were the administrators of "the Fisher estate." A large sum had been left by a Mr. Fisher for the benefit of the people of the community. He had specified certain things, but was somewhat indefinite concerning technical and agricultural education, which, however, were to be provided for in some way. The premier said: "I wish you would see Mr. A. B. Connell, who is an executor of the estate, and discuss this with him." Accordingly, a meeting was arranged and a proposition was made to Mr. Connell, that if, out of the Fisher estate, the executors would erect an agricultural school, the Provincial Department, out of the Federal grant, would equip that school, man it, and maintain it. As a result there is standing to-day in Woodstock, the Fisher Vocational School, equipped for teaching agriculture, manual training and domestic science, and so pleased are the executors of the Fisher estate that they are considering the erection of another building. The province is now building a second school at Sussex, and a third school in the northern portion of the province is in prospect; and some of us have in mind a fourth school in Fredericton. So we shall soon have four good agricultural schools carrying on the work of agricultural instruction within that province.

#### Rural Education

In the matter of rural education, a start was made in New Brunswick by the selection of a qualified, enterprising school inspector, Mr. R. P. Steeves, B.A., of Sussex. He is carrying on enthusiastically the work of introducing agriculture into the schools of the province. I venture to say that if you get the right man at work in any province along this line, he is bound to work out sooner or later in a most successful manner, a scheme for teaching agriculture in the public schools. In addition, the salaries of no less than thirteen men who are directing all the agricultural instruction in the province are paid out of the Federal grant.



The Women's Institutes also have been encouraged, and they are growing in numbers and increasing in good works.

#### AGRICULTURAL EDUCATION IN QUEBEC

In the province of Quebec, the original grant was \$159,482, which increases by annual increments of \$27,896, until, in 1917, it will bring \$271,068. In the province of Quebec, three agricultural schools or colleges are in existence, the Oka Agricultural Institute, on the Trappist estate at lake of Two Mountains ; the school at Ste. Anne-de-la-Pocatière, in Kamouraska county, below Quebec ; and Macdonald College, near Montreal. The school at Ste. Anne-de-la-Pocatière is the oldest agricultural school on the continent. That is not generally known, as the credit is usually claimed for one or two colleges in the United States ; but this, I believe, is the oldest established agricultural school of continuous existence on the North American continent, dating back to 1859. The Oka Institute and Ste. Anne-de-la-Pocatière school were doing good work, but with very limited resources. At Oka, last year, they had to turn away seventy-five students for lack of accommodation. There has been completed, or is about to be completed, at each of these institutions a building which will increase, or more than double, the accommodation now existing.

#### **Improving Teaching Staff in Schools**

The result is that these two institutions can soon take care of twice as many students as in the past.

These buildings are being financed in the same way as the others to which I have referred, \$5,000 a year being taken for the ten years of the Act to pay the cost of the buildings, the Brothers in charge of the two institutions financing them in some way. Both these two institutions were short of men. To meet the new requirements they needed not only larger buildings and laboratories, but new men. In the case of the Oka Institute, as soon as they received the money from the Federal grant—\$20,000—they brought Prof. Hansen, of the Agricultural College of Copenhagen, Denmark, an expert in bacon production ; they secured Prof. Walsh, D.Sc., a graduate of the University of Geneva ; and a third man, Prof. Nagant, a graduate of the University of Louvain, Belgium. Think what an addition it must have been to the staff at Oka to draw men from institutions of this kind in Europe. Unfortunately, two had to go back last fall, and one of them is now a prisoner in Germany, so that the teaching at present is somewhat handicapped. At Ste. Anne-de-la-Pocatière the same plan has been followed. At Macdonald College eight additional instructors have been appointed, chiefly to carry on extension work. Many other lines have been

inaugurated and extended by the Provincial Department, such as fruit culture, dairying, tobacco-growing, bee-keeping, drainage, and domestic science instruction. The result is that twenty-seven offices have been created in Quebec, provided for out of this grant, and twenty-seven permanent instructors appointed. In addition to these, there were many temporary assistants during the summer.

#### DEVELOPING AGRICULTURAL INSTRUCTION IN ONTARIO

In Ontario the grant was \$195,733 the first year, with an addition of \$33,147 annually until, in 1917, the grant will be brought up to \$336,319. Ontario had more lines of agricultural work organized than any other province, so that, naturally, what they would do would be mainly to extend or enlarge the organization already in operation. The Federal grant furnished them with additional instructors, and the Provincial Department also added a few more branches or departments. In all, 49 instructors have been appointed so far. There have been created a department of co-operation and marketing, and also a department of vegetable growing. But the main use of the money in Ontario has been simply to take the organizations already created, enlarge them and appoint more men. In regard to district representatives, through this grant, the province has been able to provide for twenty additional counties and now there are only three counties left unprovided with district representatives of the Provincial Department. The twenty new offices which have been created, call for the appointment of twenty men, each having an assistant, and this branch thereby accounts for forty additional instructors in agriculture spread over the province and carrying the work of instruction direct to the farmers on their own farms. The Agricultural College at Guelph was in need of further equipment and the Federal grant assisted materially in providing increased accommodation there. In the first place, the finest field husbandry building on the continent stands there to-day—nothing superior, and, I think, nothing equal to it, is to be found anywhere in the United States. Then there are new dairy barns, and a most complete and serviceable poultry building. And work is now proceeding on a fourth building devoted to soil physics.

#### Boys' and Girls' Competitions

I have mentioned two new lines of work; another one I would like to refer to particularly, because it is spreading so much more rapidly than its most earnest friends expected, it is the plot-growing competition work done by boys and girls on the farm, and the exhibition of products at school fairs. You can go to some counties in Ontario where they

have school fairs held by boys and girls of the farms, who bring the products of their plots, stables, poultry, dairy, etc., which are drawing larger crowds and attracting more attention than many of the old established autumn fairs. The enthusiasm with which they have taken hold of this is most extraordinary. Full reports of this work will be available shortly. Through work of this kind agriculture in the province is getting a grip on the boys and girls on the farms that has never been known before. This project was a happy suggestion. We are getting favourable reports of the results obtained from it in all the provinces, from British Columbia, in the West, to Prince Edward Island, in the East. Wherever the boys and girls do the work, produce things themselves, and bring the products into competition, the greatest interest is being aroused. If we can only get hold of the boys and girls on the farm we need not worry about their fathers and mothers. To-day sixty-five farmers' sons are being given a short course at the Agricultural College at Guelph, and it is out of the Federal grant that their expenses to that college have been paid. Each one of those boys, in his own county or district, won first place last year in growing potatoes in acre plots. The prize was a two weeks' free course at the Agricultural College. Many of these boys will, later, go back for a longer course.

The foundations have been laid in Ontario for an extensive teaching of agriculture in the schools. The Provincial Department of Education supplemented its own grant by adding to it from the Federal grant, \$10,000 in 1913 and \$13,000 in 1914. In 1915, the addition will be \$30,000.

#### UNIQUE METHODS IN MANITOBA

The grant to Manitoba in 1913 was \$51,730. An annual addition of \$6,346 will bring it, in 1917, to \$77,114. Manitoba is peculiar in that the Department of Agriculture handles all the money itself; none of it goes to the Agricultural College for additional members to the staff or for supplementing salaries as in other provinces, and none goes to the Education Department for teaching agriculture in the public schools. The Provincial Government has decided that it is the best way for Manitoba and is expending it that way.

#### **Nature Study in Schools**

The Department of Education has, for some time, carried on the work of teaching nature study and agriculture in the schools under the direction of Mr.

J. H. Watson, B.A. The Provincial Department spends most of the money obtained from the Federal grant in demonstration farms, and in demonstration trains. Their purpose is to organize



these demonstration farms all over Manitoba. Seven additional permanent instructors have also been appointed.

The extension of mixed farming is of great importance and these demonstration farms or plots are to teach the men, who for the last 26 years have been growing wheat alone, that money can be made out of other crops, that the farms can be kept cleaner and more profit made. They are steadily directing the farmers of the West to mixed farming. Let me give just one instance in connection with instruction work there. Last spring, Mr. S. A. Bedford, the Deputy Minister of Agriculture, told me that he was very much concerned about the conditions among the Ruthenians. They were small dairy farmers, but the creameries would not take their milk, as their methods of handling it were unsatisfactory. He reported that there was only one way whereby they could be helped, and that was by sending a special instructor to work among them. The Minister appointed a special instructor, and, as a helper, engaged an interpreter also. These two men started out in the early summer among the Ruthenians, going from house to house, showing them how milk and its products should be handled, and last autumn Mr. Bedford stated that a great improvement had been made; some of them are now sending their milk to the creameries.

#### METHODS APPLIED IN SASKATCHEWAN

In Saskatchewan, \$54,296 was the appropriation the first year, and an annual addition of \$6,859 will bring that up to \$81,733 in 1917. No two provinces expend the grant in the same way. This province divided the money equally; one-half being given to the Faculty of Agriculture of the University of Saskatchewan, and the other kept to be spent directly by the Department of Agriculture. In this way Dean Rutherford has an annual increase of \$27,000 to his provincial appropriation. President Murray and Dean Rutherford decided to invest the money in additional men for the staff of the university as rapidly as qualified men could be obtained. The result has been that already thirteen additional professors and instructors have been appointed. These men were put on mainly for the purpose of extension work. In addition to the thirteen added to the staff of the university, eight provincial instructors attached to the Agricultural Department have been appointed, making in all twenty-one.

#### Agriculture in Public Schools

The next move is to introduce agriculture into the public schools of the province. The province is about to appoint a director of rural education, and one or two directors of domestic science. I am not sure whether or

not they have yet found the man for that position. Saskatchewan has decided to take the annual addition to their grant, and set it aside for instruction in the public schools. That would be \$7,000 this year and \$14,000 next year and \$21,000 the year after, increasing thus until each of the three branches share equally.

#### AGRICULTURAL SCHOOLS OF ALBERTA

We come next to the province of Alberta. When I first visited Edmonton in connection with this work, the Minister of Agriculture said to me : "I want an agricultural school in Alberta. We have six demonstration farms, and I would like eventually to have an agricultural school at every one of these farms." He said that he thought he could get one school erected that year, if he could use the Federal grant to equip and maintain it. I replied that the money could be expended on one, two or more schools if the Government so desired. After attending a meeting of the cabinet-in-council, held that same day, he was able to report, that when the council was told that the Federal money could be used to equip and maintain these schools, it was agreed to provide not only one, but three schools. The three schools were established, and are now holding classes in their second year.

#### Getting Qualified Instructors

At a later interview, the Minister announced that he was anxious to secure a qualified Canadian, if possible, to put in charge of the third school. I told him of a man who filled the requirements, but who was at that time in the United States. What we want is to get as many as possible of our educated Canadians back into Canada, because we need them. We have been exporting them for years. The state in whose employ this man was working raised his salary \$200 or \$300, but the Minister met the increase, and the result is that Mr. Howe is now in charge of the agricultural school at Vermilion. He is being paid \$2,700. Of course when they paid that salary to one they had to look for \$2,700 men for the other schools also.

The Canadian Pacific Railway Co. have been watching the work of these schools in Alberta, and the officials are so satisfied with the value of agricultural instruction that they are inclined to give some substantial assistance. Did you ever hear of anything just like that proposed in this country before ? The work done in these schools must be valuable if a railway corporation thinks they are of such value that money should be given to build another school.

There are fifteen instructors in agriculture in Alberta provided for out of the Federal grant. This grant started with \$46,095, and increases by \$5,219 until it reaches \$66,971 in 1917.

## AGRICULTURAL INSTRUCTION IN BRITISH COLUMBIA

In British Columbia, the appropriation the first year was \$47,334, and an annual increment of \$5,467 will bring it to \$69,202 in 1917. The Provincial Department has been using its Federal grant mostly for field competitions, and boys' and girls' competitions. The officials have been carrying on field-crop competitions very extensively all over the province. It is a very expensive province in which to do work. Travelling is high and the valleys are far apart, so that they cannot be expected, with \$50,000, to do anything like the work that is done with a similar amount in the Maritime Provinces. Those in charge of the work say they can see most decidedly beneficial results from their competitions and their instruction in the growing of field-crops.

**Agriculture in Public Schools**      An extraordinary incident occurred at a conference with the Provincial Departments of Agriculture and Education in the spring of 1914. I pointed out to them at that time that they were not using any of the Federal grant for teaching agriculture in the public schools, and that, while field and garden competitions were probably valuable, it was essential that agricultural instruction should be carried on in the public schools, in order to make the work permanent. The officials quickly assented and, to our agreeable surprise, they have this year set aside no less than \$15,000 out of their \$52,000 grant, for this work. That is, at present, the largest appropriation made by any province in Canada, and it simply proves how much British Columbia appreciates the value of public school instruction. Mr. J. W. Gibson, lately of the Ottawa Normal School, was placed in charge of this work. I would like to read two or three sentences from a letter received from Mr. Gibson only yesterday :

"I arrived Friday afternoon, July 3rd [1914], and took charge of the summer school students in agriculture, who arrived Monday morning, July 16th. I expected about thirty or forty at the most. We had 180 on the roll, and 171 finished the course. We had 600 teachers in summer classes in Victoria for one month—over one-third of the teaching staff of the province. I was quite unprepared for such a crowd. Thanks to the co-operation of the Department of Agriculture, we were able to avail ourselves of the services of several men engaged here in that department. Mr. Scott, Deputy Minister of Agriculture, has given me every assistance, as has every man I have had to do with in his department."

Nine agricultural instructors are being paid out of the Federal grant to British Columbia.



Details of the lines referred to and also of many other lines of provincial educational work, not touched upon here, will be found in the report to the Minister of Agriculture, Hon. Martin Burrell, which has just been completed, and which will be available in a few weeks.

### GENERAL RESULTS THROUGHOUT CANADA

What are the results ? The Federal grants have furnished about \$250,000 for buildings and equipment for agricultural instruction ; they have provided for 155 permanent instructors in the several provinces ; they have made possible an extension of the lines of demonstration in every province ; they have enabled several provinces to organize for instructing the women of the farm ; and they have made great progress in initiating and extending the work of teaching agriculture in the public schools. To those who hear these words, or read them in print, there is no need of argument as to the benefits that may accrue. One of the most active of our agricultural leaders has said : "We needed money, our province is poor, we did not know where to look for more. This grant came just at the right time. What we need is *more*, for we know how we could spend it with good advantage to the country."

One more word in conclusion. The successful carrying out of legislation of the nature of this *Agricultural Instruction Act*\* is dependent upon the spirit of those behind it, as well as the attitude of those whom it immediately affects. I have stated that the Provincial Departments, both Agricultural and Educational, have heartily co-operated. I would like to make special mention of the fact that the Minister of Agriculture, Hon. Mr. Burrell, has given it his most

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### \*THE AGRICULTURAL INSTRUCTION ACT

2ND SESSION, 12TH PARLIAMENT, 3-4 GEORGE V., CHAP. 5, 1912-13. *Assented to 6th June, 1913.*

An Act for the granting of aid for the advancement of Agricultural Instruction in the Provinces.

Whereas it is desirable that encouragement be given to agriculture in all the provinces of Canada, and whereas great and permanent benefit will result through education, instruction and demonstration carried on along lines well devised and of a continuous nature : Therefore His Majesty, by and with the advice and consent of the Senate and House of Commons of Canada, enacts as follows :—

1. This Act may be cited as *The Agricultural Instruction Act*.

2. In this Act, and in any regulations made hereunder,—“Minister” means the Minister of Agriculture  
“province” or “provinces” shall not extend to or include the Northwest territories or the Yukon territory.

enthusiastic support. It was not merely the fulfilling of a promise, or the meeting of a demand ; it was the framing and carrying out of legislation in accordance with his own personal views and in harmony with his general agricultural policy.

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SIR CLIFFORD SIFTON : I am sure we have been very much interested in what Dr. James has said. I have not the least doubt but that the work being done under his direction is by far the most important and most far-reaching with reference to the general permanent prosperity of Canada of anything that is being done at the

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3. For the purpose of aiding and advancing the farming industry by instruction in agriculture, and for the purposes authorized by this Act, the following sums, aggregating ten million dollars, shall be appropriated and paid out of the Consolidated Revenue Fund of Canada during each fiscal year for the period of ten years beginning with the year ending the thirty-first day of March, one thousand nine hundred and fourteen, namely :

During the fiscal year ending the thirty-first day of March, one thousand nine hundred and fourteen, the sum of seven hundred thousand dollars ;

During the fiscal year ending the thirty-first day of March, one thousand nine hundred and fifteen, the sum of eight hundred thousand dollars ;

During the fiscal year ending the thirty-first day of March, one thousand nine hundred and sixteen, the sum of nine hundred thousand dollars ;

During the fiscal year ending the thirty-first day of March, one thousand nine hundred and seventeen, the sum of one million dollars ;

During the fiscal year ending the thirty-first day of March, one thousand nine hundred and eighteen, the sum of one million one hundred thousand dollars ;

and the like sum of one million one hundred thousand dollars during each of the succeeding fiscal years until the expiration of the fiscal year ending the thirty-first day of March, one thousand nine hundred and twenty-three ; provided that any portion of any of the above sums which may remain unearned or unpaid at the expiration of any of the said fiscal years previous to the last shall be carried forward and remain available according to its apportionment for the purposes of this Act during any one or more of the succeeding years.

4. The moneys appropriated for each year shall be apportioned and paid as follows :

(a) An amount not exceeding twenty thousand dollars shall be paid in each year to assist in the work of veterinary colleges established in the provinces, the said annual amount to be distributed among the colleges qualified and legally authorized to grant degrees in veterinary science in proportion to the number of students enrolled at the said colleges respectively for the previous year and in accordance with such regulations and conditions as may be prescribed by the Minister ;

(b) The sum of twenty thousand dollars shall be paid in each year to the Government of each province ;

(c) The remainder of the appropriation for each year shall be allotted and paid to the Governments of the respective provinces in proportion to the populations of the said provinces respectively as determined by the latest decennial census.

5. The payments hereinbefore authorized shall, as to each province, be conditional upon agreement between the Minister and the Government of the province as to the terms, conditions and purposes, within the meaning of this Act, upon and for

present time. For my part I am very glad to know it is in good hands. I have known Dr. James a long time. I know something of his past career, and I do not think the Department of Agriculture has made any mistake in taking him as adviser in connection with this work. I want to say to him that whoever may or may not support him in the work that he is doing, so far as the Commission of Conservation is concerned, its members, its staff and its officers, can be relied upon to give unswerving and constant support among those whom we influence or control.

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which the payments are to be made and applied, and such agreement shall be subject to the approval of the Governor in Council.

6. The Minister may appoint such officers as are required for carrying out the provisions of this Act, and for such inspection, examination and report as are necessary to insure the expenditure of the moneys paid in accordance with the intention of this Act and the agreements and regulations made under the authority of this Act ; and the salaries and expenses of such officers shall be paid out of the moneys appropriated by Parliament for the purpose.

7. The Governor in Council may make such regulations as are deemed advisable for giving effect to the objects and purposes of this Act, and, notwithstanding anything in this Act, the Minister, with the approval of the Governor in Council and with the consent of the Lieutenant Governor in Council of any province and upon such terms and conditions as are prescribed by the Governor in Council, may expend in any such province in any year the whole or any part of the grant provided for such province under this Act for the purposes set forth in the preamble of this Act.

8. The Minister shall annually lay before Parliament, during the first ten days of the session, a report of all proceedings under this Act for the last preceding fiscal year, which report shall contain a full and accurate statement of the moneys expended, the purposes to which they have been applied and the work done by the several provinces in the earning of the subsidies paid or authorized to be paid.

9. *The Agricultural Aid Act*, chapter 3 of the statutes of 1912, is repealed.

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# Protection of the Sea Fowl of the Gulf of St. Lawrence

BY

JOHN M. CLARKE, Ph.D., D.Sc.

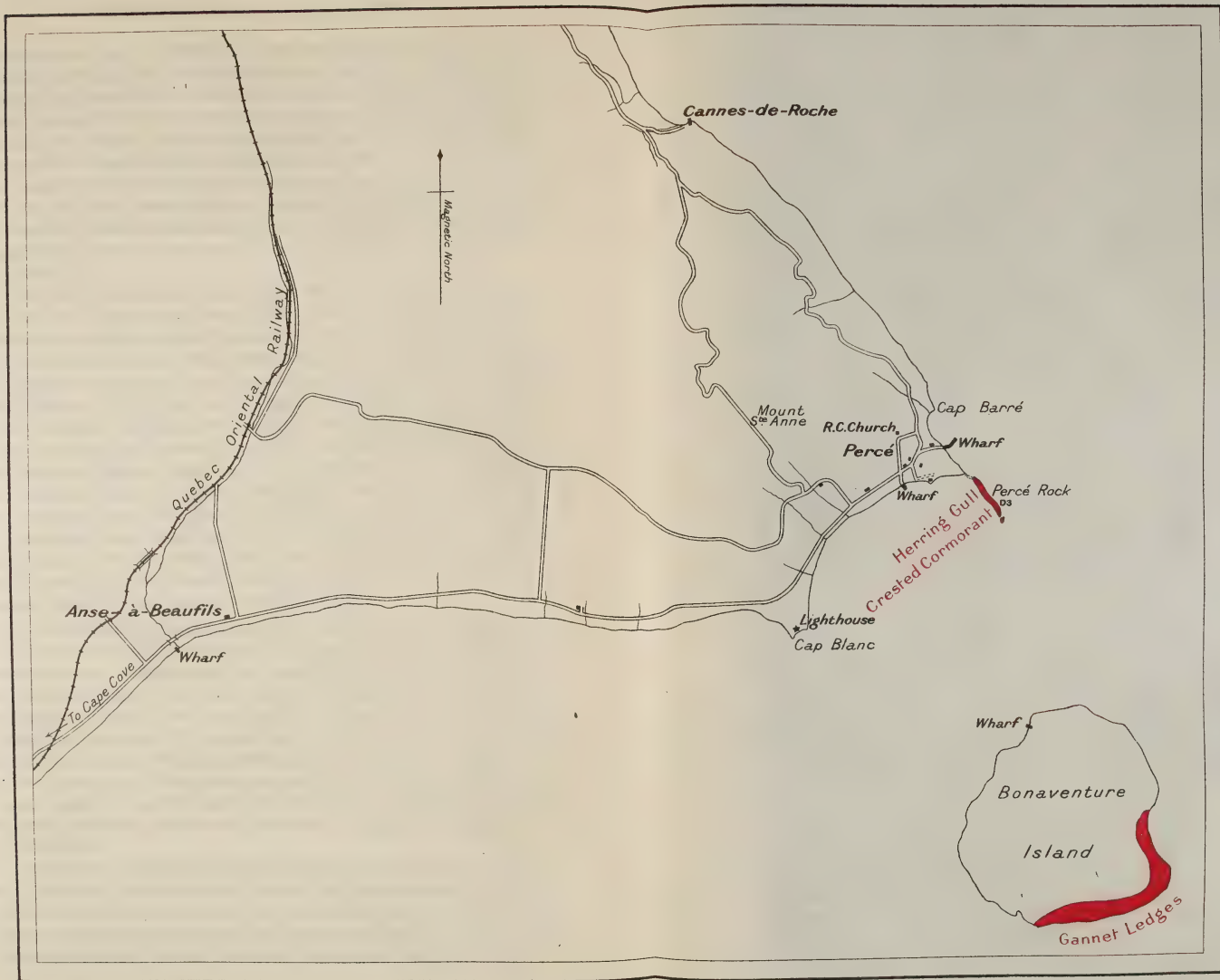
*Director of the State Museum, Albany, New York*

**M**R. CHAIRMAN, ladies, and gentlemen of the Commission of Conservation : I am certainly very appreciative of the courtesy which has been extended to me in asking me to speak on such a subject as that which you have chosen. I am injecting an entirely sentimental topic into your programme, which has otherwise to do with serious matters, and it would seem as though the present of all times was not the time to present it ; but, as the Commission has thought differently, I am very glad indeed to bring to your notice a problem which is very close to me personally on account of my long acquaintance with that portion of the province of Quebec included within the Gaspé peninsula, where I have made my summer home for a period of fifteen years.

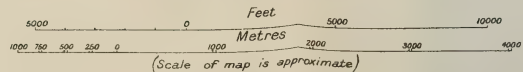
The matter before our minds at this time is, as I said, so wholly grounded in sentiment that it may seem of diminutive importance in the face of an overwhelming human issue. Whatever may be the turmoil abroad in the world, it cannot change the fact that the attitude of government toward the protection of its natural resources is an index of its best attainment. This is all the more true of an assumption which presents no possibilities of a commercial or material benefit. We recognize the fundamental proposition that the government which does not early see the importance of restraint from over-indulgence in the bounties of nature, and its seemingly inexhaustible possibility of wealth, is negligent and even suicidal. Time teaches the necessity of such restraint with the visible, and practical economy soon develops the imperative demand for uncovering the invisible, resources of the earth. The impetus to make a country yield its full flower and fruit in every direction with which nature has endowed it has been productive of the finest scientific efforts which civilization has wrought out.

## Place of Water-fowl in Nature

Here, however, is a different proposition : to save to the world certain species and groups of water-fowl, now travelling the rapid road to extinction. If they are not saved, who can say the world is poorer in a material or commercial sense ? If they are saved, protected and allowed to



PERCÉ AND BONAVENTURE  
BIRD COLONIES



(Scale of map is approximate)





propagate and keep possession of their ancient domain, who can say that the world is in any wise materially the richer ? The birds that frequent the remarkable breeding places in the gulf of St. Lawrence—the venerable Bird rock, the most ancient monument of Canadian history, the cliffs of Bonaventure island and the dramatic Percé rock—are no special profit to material concerns of humanity ; no one can eat them, their eggs are no longer of moment as a source of food supply ; and, indeed, some of the members of these remarkable colonies are under present indictment of living too freely on the young fry of the salmon streams ; thus, it is alleged, affecting human happiness.

The races of these birds are on that easy road that leads to destruction. The appeal, then, if they are to be saved, must be to the trained sentiment which deprecates and mourns the destruction from off the earth of any of nature's creations ; which, as one might say, gets the proper angle and apprehends their significance in the great scheme of life. In every civilized community there is a large, a very rapidly growing and perfectly comprehensible sentiment, that would protest against a needless and an entirely avoidable destruction or waste of these products of creation. Such a sentiment is a natural emotion ; it springs both from a sympathy inborn with our aboriginal state, and from an acquired appreciation of the ages of labour and experiment on the part of nature, in trying out her methods and her products, until these ends have been reached—ends, indeed, which, though seeming final, may actually be mere passing stages on the way to something better.

In a young country, as large as yours, where population and settlement have been making a hard fight against the embarrassments of the wilderness, it is natural that immigrants and invaders should have shown a disregard of native life in so far as it fails to contribute to human comfort. But the fact is an open one, that the more dense the population, the more highly cultivated the state of the land, the greater becomes the abundance of wild life. This fact is evident throughout European countries, where, in the midst of a dense population, native races of birds, beasts and fishes are preserved in probably greater abundance and variety than even in new lands like this.

Our course towards our native species of birds has been historically incorrect until these later years. We have already permitted the total extinction of some of our native birds and the reduction of others to such scattered remnants, that extinction at an early date seems unavoidable, unless the arm of the law can reach farther than it is now doing.

**Extinct Species  
of Birds**

Our American bird fauna has suffered serious permanent losses ; first and foremost, from the islands of the gulf of St. Lawrence, the great auk and the Labrador duck. To-day the passenger pigeon is gone, although at one time, as we all know, it was so tremendously abundant in this country and the United States and such an obstruction to the ordinary operations of the struggling farmers that it called forth the excommunication of the bishops. The wild turkey, sacred to the Puritan harvest feast, is exterminated from Canada ; the whooping crane, the trumpeter swan, the golden plover, the Hudsonian godwit, are all nearly extinct ; the willet and the dowitcher are also on the same declining path.

Now, so far as our birds contribute to the protection of our commercial assets, in so far as they prevent by many millions of dollars in annual value the destruction of our agricultural crops, our forest and shade trees through the incursions of noxious insects, just in so far there is an imperative reason why they should be safeguarded by every restraint within the power of the people. No argument is needed and no defense is required for the much talked of "restriction of personal liberty" in the destruction of insect-eating birds. We have reached and passed that point. Nothing can so irrevocably restrict personal liberty to hunt and shoot as the entire destruction of game, and this very selfish consideration alone is efficient in the execution of the protective laws ; and yet it is questionable whether our restrictive measures have been taken in time to be fully effective.

**Birds in the  
Scheme of  
Nature**

During my journey to Ottawa, I read a statement in the press relating to the Commission on Industrial Relations which is investigating the finances of some of the foundations such as the Rockefeller foundation. The chairman of that Commission, who is from Missouri, said that he noticed that \$250,000 had been set aside from the fund of the Rockefeller foundation, to provide a safe retreat for migratory birds. It is true that sum was expended to reserve certain islands on the South Atlantic coast for migratory birds. He welcomed the protest that had come to him that this money might better have been expended to establish a safe retreat for the wives and babies of the Colorado coal miners. I happened to have in my pocket at the time, the last number of the *Canadian Forestry Journal* which I had just received. In it, I found a little poem, which I think completely supplied the answer to his argument. The lines, which are by Mr. Ralph Hodgson, one of the younger English poets, are as follows :

## STUPIDITY STREET

I saw with open eyes  
 Singing birds sweet,  
 Sold in the shops  
 For the people to eat—  
 Sold in the shops of  
 Stupidity Street.

I saw in vision  
 The worm in the wheat,  
 And in the shops nothing  
 For people to eat—  
 Nothing for sale in  
 Stupidity Street.

**Protective  
 Legislation**

There is a fundamental principle here upon which the effectiveness of game laws and general protective methods must be estimated, and it is the sole criterion by which we can be guided. No system of protection can be efficient if, under it, the native birds or animals are still diminishing from year to year. Such a condition would be of itself proof that we are destroying more than the annual increase and using up both interest and capital ; and it is to my mind an open question whether our present laws have up to this time been effective in this regard. So much they have effected, that the falling off of the native races is less rapid, but there is an actual annual diminution, even though, in some instances, small, and progressive diminution spells extinction. I cannot undertake to speak of the relative merits of general laws of protection, but incidentally may observe that in my own state the inefficiency of the general protective laws, outstanding for some years past, has led to later very severe and stringent regulations in virtue of which it has become an offence to destroy any of the native races of birds, with discriminations against an exceedingly small number regarded as reckless in their disregard of agricultural and fishing interests. I refer to this law without any special reference to open and close game seasons.

I would like to say another word regarding the existing system of protective laws in respect to its failing to meet the requirements of adequate bird protection. If we can not through legislation sufficiently reduce the destructive agencies acting upon species which are actually vanishing, particularly a considerable number of our game species whose fate now hangs in the balance ; if we can not



instill into the pot-hunter, the resident or citizen foreign to our mode of thought and our high purposes, of the man out of the reach of observation, who thinks to deceive others while indulging himself; if we can not make the executive effect of our laws reach into those remote corners where these native races are propagating, then we must turn to the encouragement of a proper spirit and sentiment amongst our citizens, encourage, not merely actual respect and regard for these races, but active interest in their preservation, by the erection and protection of places which are to be totally exempted from a hunter's privileges. Preserves, reservations, bird sanctuaries, places of refuge, where such security can be afforded, become more and more a necessity as the remoter regions of our land become more readily accessible and more fully settled.

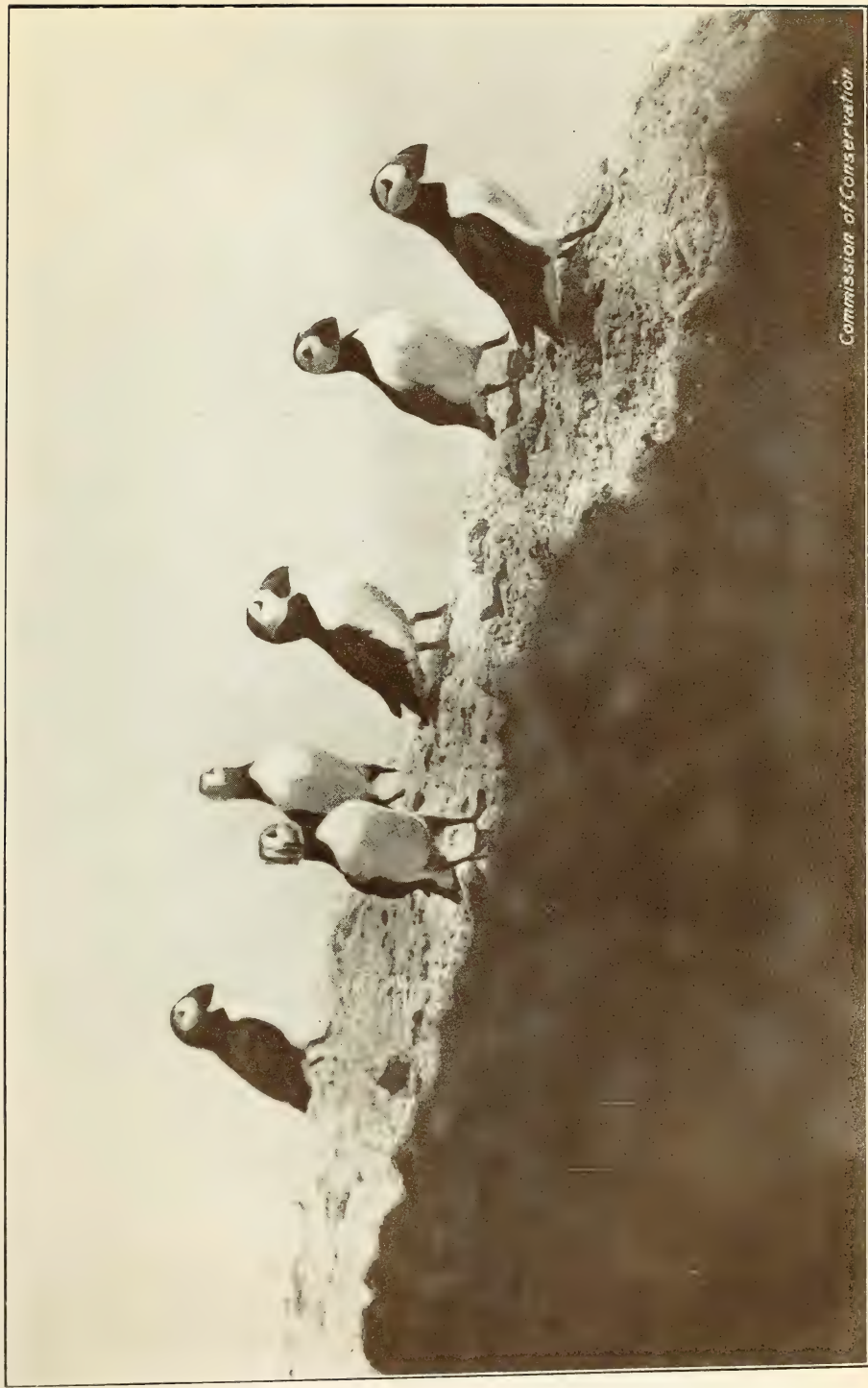
#### **Bird and Game Reservations**

Our Governments—yours and mine—in the splendid national parks which have been set apart, have furnished almost ideal conditions for the safe reproduction of the species of birds that naturally inhabit them, but these are great parks, and, from their size and cost of maintenance, must always be too few in number to sufficiently supplement other means of protection. We find growing up about us in the salutary development of public sentiment on this matter of protection, private refuges for bird and beast. I count it among the wholesome developments of our civilization that reserved spots on this estate, on that private domain, a breeding place near some municipality taken in charge by some private organization—that such refuges as these are increasing. I find, too, in such a proposition as has been brought to the attention of the province of Quebec by Lieut.-Col. Wood regarding the sanctuaries or refuges for the native races of animals in the Quebec Labrador, a fine expression of the earnest desire and purpose of the lover of nature to protect the works of nature.

It is needless for me to say that small areas taken at random can accomplish much toward the preservation of our natural bird species, but to be effective, a small reservation must be segregated at some point to which the failing species themselves have made resort because of the especial attractions and facilities the places offer for their multiplication; and this brings us immediately to the consideration of the islands of the gulf of St. Lawrence and their bird colonies.

Time was, in the early days, when all the islands off the coast of the gulf and in the gulf of St. Lawrence and off the coast of the Labrador, were to our Atlantic coast what the islands of the Hebrides, St. Kilda, Ailsa Craig on the west and Bass rock on the east of

*Photo by Mr. P. A. Taverner*



*Commission of Conservation*

RAZOR-BILL AUKS, BONAVENTURE ISLAND, GASPE CO., QUE.





Scotland, the Skelligs off Kerry, and its neighbours off Devonshire—all these islands with their wondrous colonies of these very birds with which our attention is now concerned—have been to Britain.

PRESENT CONDITION OF NESTING PLACES IN THE GULF  
OF ST. LAWRENCE

**The Bird  
Rocks**

These islands, constituting the northernmost member of the Magdalen Islands group, belong to the county of Gaspé. They lie 120 miles out in the gulf and consist of three isolated rock masses, the first, or the Great Bird, covering about seven acres, and the Lesser Birds, which are two bare rock masses, lying close at hand on the west, and being little more than rock reefs. The Great Bird has no human population except the lightkeeper and his assistants. The bird colony here consists of several species of water-fowl of which the gannet or solan goose is preponderant, the others being the razor-bill auk, the puffin, the murre and the kittiwake.

In the days of the early settlements, the "Isles de Margaulx," as they were called by Cartier, housed an enormous and numberless colony. When Audubon visited the place in 1833 he found and made record of what was not generally known at the time, that the attacks of the eggers upon the gannet nests here and elsewhere, particularly on the Labrador coast, resulted in the collecting of some hundreds of thousands of eggs annually, which were sold in the New York and Boston markets. These attacks have undoubtedly been the cause of the extinction of the gannet roosts on the islands and coasts of the Labrador, on Perroquet island and on Grand Manan. Since the establishment of the light on Bird rock the attacks of the eggers on this colony have diminished, but the colony has been, and is yet, exposed to the demands of the fishermen for eggs and to the incidental killing of the birds.

**Census of  
Bird Colonies**

The history of this bird colony has been fairly summarized in the recent publication, *The Gannet*, by J. H. Gurney, F.Z.S. (London, 1913), and the statement there incorporated in regard to the census of the colony ten years ago, quoted from observations made by Mr. A. C. Bent, would make the total of the colony about 10,000 birds, of which there were 2,500 gannets, 2,000 kittiwakes, 1,800 razor-bills, 1,600 brunnich murre, 1,400 murre, 100 ring murre, and 600 puffins.

My visits to this colony have been of more recent date, 1910-11, and, without attempting to make an estimate of the total population, I believe that the gannet element in the colony is larger than above intimated and that the total census of the birds would probably not

fall below 15,000. In my judgment, the colony is not, at the present time, decreasing, and I think this is due largely to the comparatively few visits being made in these latter days to the islands by collectors of birds and of birds' eggs.

The Bird rock with its adjoining islands being Crown lands, guardianship could, in my judgment, be most efficiently accomplished by assigning that duty to the inspector of fisheries on the Gaspé coast. This official, having a cruiser at his disposal, is more frequently on the Magdalen islands than any other official of the Government. Having supervisory functions, he could, with the aid of the light-keeper as guardian on the ground, exercise a forcible protection of the place.

**Bonaventure  
Island Colony**

The bird colony on Bonaventure island has the same constitution as that on Bird rock. This island lies three miles off the coast from the village of Percé.

It is private property, and its area of about six square miles is practically held in fee by the present occupants, among which is one of the oldest fishing establishments on the Gulf.

During the past summer, at the instance of the Geological Survey, Mr. P. A. Taverner, with his assistants, made a special study of this colony, and the breeding habits of the birds, and endeavoured to make an approximate count of the number of birds there.\* Here, also, the gannet is paramount in numbers, and I believe Mr. Taverner's judgment is, subject to reservation and correction, that the gannet population on the island is approximately between 7,000 and 8,000. This is a very much larger number than is assigned to the gannets of the Bird Rock colony, and demonstrates that the Bonaventure colony as a whole—assuming that there is approximately the same numerical relation amongst the other species there nesting—is very much the largest colony of these water-fowl in the Gulf, and hence on the Atlantic coast of North America.

**Unique  
Conditions  
on Island**

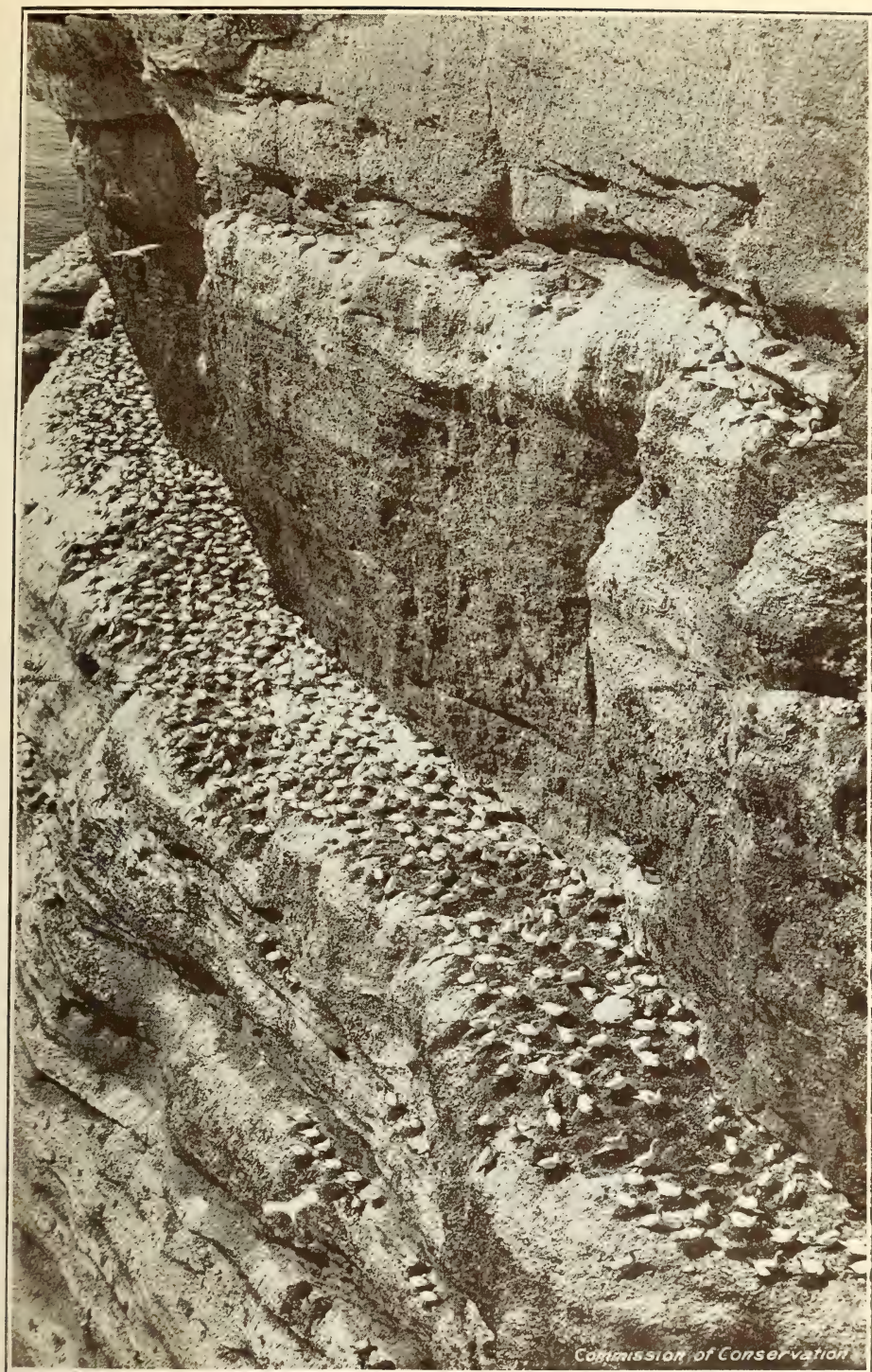
This colony finds its nesting places on the vertical eastern ledges of Bonaventure island, which rise sheer to a height of about 400 feet, and stretch over a length of about a mile and a quarter. They are well protected from above, but now that the day of the motor boat has arrived, they are bare and exposed from below, and the destruction which has been inflicted upon them of late years by "the fool with a gun" has been appalling. This statement will, I believe, be verified by the investigations and reports of Mr. Taverner.

The protection of this very remarkable, if not altogether unique, nesting place, presents some provisional obstacles in the way of

\*See Appendix III.



*Photo by Mr. P. A. Taverner*



GANNET NESTING LEDGES, BONAVENTURE ISLAND, GASPE CO., QUE.





administration. I have secured from the property owners a tentative promise to deed the ends of their lots bounding the bird ledges, in exchange for the construction of a fence near the edge of the cliff, which would prevent their sheep and cattle from falling over. The erection of this fence may be reasonably assured, but the proper administration of this property, thus deeded for a specific purpose, and the maintenance of a warden, are matters still open for determination. If it lies within the powers of the Parks Branch of the Department of the Interior to assume protection of these bird ledges as such, without incursion upon the property rights of the owners of the land, such action would, in my judgment, be the simplest solution of what has appeared to me a somewhat complicated problem.

Because of the accessibility of this colony, its great and apparently increasing size, it is now recognized as one of the wonders of the Gulf coast and is visited daily during the tourist season. These facts seem to demand early and vigilant action for its protection.

**Percé Rock  
Bird Colonies**

Percé rock, off the village of Percé—the most dramatic scenic feature on all the Atlantic coast — is the abode of a colony composed of two species, namely, the herring gull and the crested cormorant. This venerable assemblage has been here since the beginnings of human history on the coast, and the upper surface of the rock has never, so far as records show, been the breeding place of any other species.

A year ago an indictment was brought against the cormorants of this colony, accusing them of destroying the young fry of the salmon in the many salmon streams of the mainland adjoining. The indictment was followed by an order, subsequently suspended, to destroy the cormorant colony. The investigations of ornithologists have failed to prove that the cormorant feeds especially on the young of the salmon. After somewhat diligent inquiry of authoritative sources, I have failed to find any ornithologist who would say that this accusation has been proven, and I think I may take the liberty of saying that the investigations of Mr. Taverner are not confirmatory of the indictment.

Percé rock, for its unique beauty, for its extraordinary scientific interest, and for its bird colony, presents strong claims for reservation. The fishermen along the coast do not regard these birds as their enemies. They help themselves, now and again, it is true, to the contents of the herring nets, but where herrings occur in untold millions the birds' necessary appetite for fish food involves damage to human interests which is certainly negligible. Moreover, the birds are so intimate a part of the human

interests of the countryside, that I may express with confidence the feeling of the fishermen as wholly in their favour. Yet, this colony is exposed to constant attacks, for the young gull, when on the beaches still unable to fly, falls an easy victim to the attacks of the fishermen, it being to them a favourite viand.

#### PROTECTION OF THE BONAVENTURE AND PERCÉ COLONIES

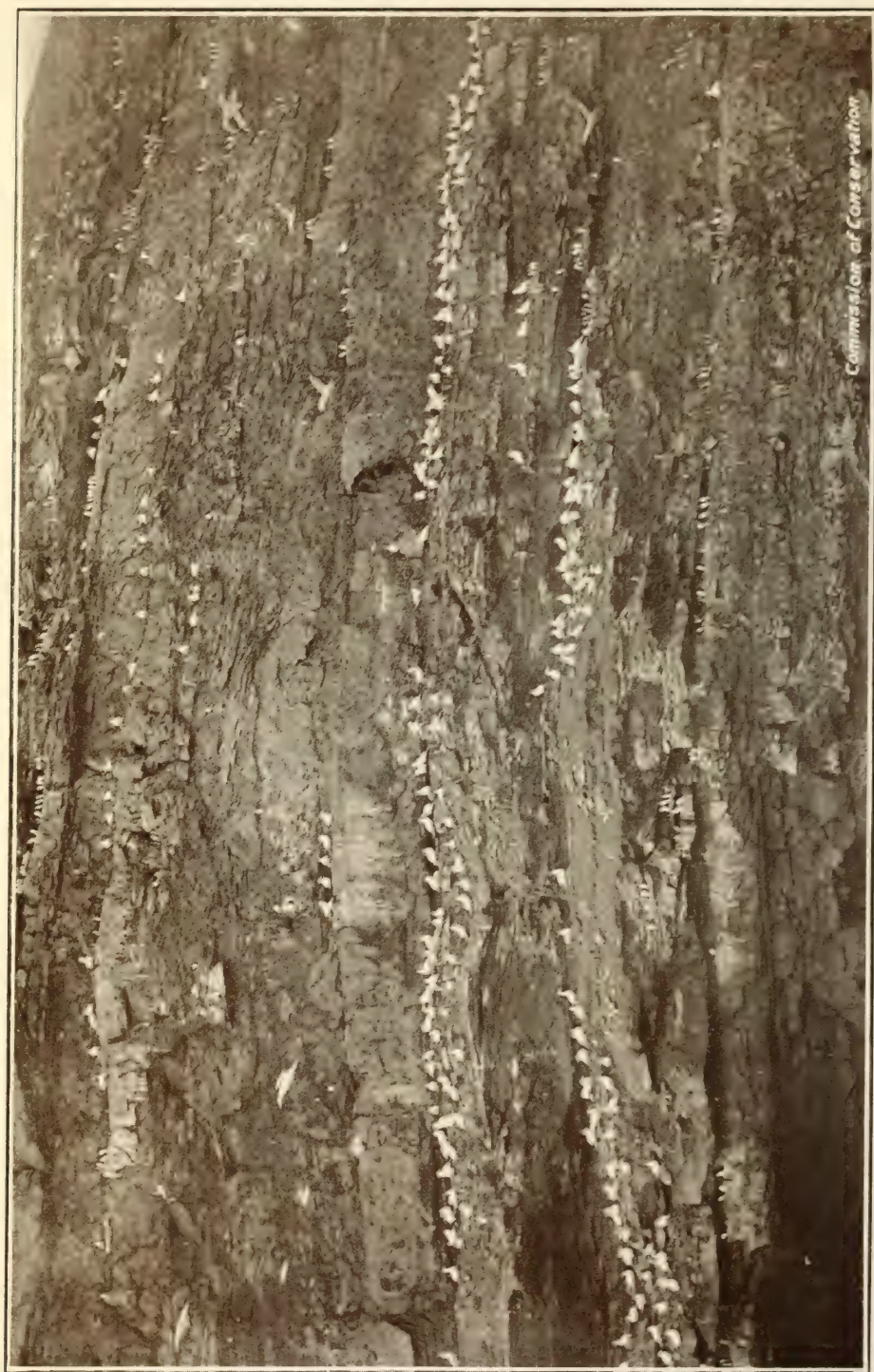
In presenting the claims of these bird colonies to your consideration, it seems proper that I should recommend also to your notice a practicable procedure concerning their guardianship. A single warden is all that will be required for this purpose, and there lives on Bonaventure island a man by the name of William Duval, a descendant of the original owner of the island, whose interest in these birds is very keen. He is daily back and forth from the island to the mainland, is known to me to be faithful, trustworthy and efficient, and he is by all means the best man to act in the capacity of warden of these two nesting places during the months of the presence of the birds, from April to October, inclusive.

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SIR CLIFFORD SIFTON : I am sure we have listened to Dr. Clarke's interesting and instructive address with very great pleasure and we are very much indebted to him for coming to us and giving us his address. I see in the audience our friend Dr. Hewitt. I shall ask him to continue the discussion of the subject which Dr. Clarke has outlined so interestingly.







*Commission of Conservation*

BIRD ROCK, GULF OF ST. LAWRENCE  
The larger birds are gannets, the smaller ones murres

# The Protection of Birds

BY

C. GORDON HEWITT, D.Sc.

*Dominion Entomologist*

**I** HAVE listened with great interest to the address of Dr. Clarke, as it has been along lines in which I have been interested all my life. My work at present, however, is concerned with the destruction of those enemies of our crops, namely, insect pests, which are able to deplete our production to so great an extent.

In so far as birds are the chief enemies of our insect pests it becomes a most important consideration, in the destruction and control of those pests, to pay particular attention to the encouragement and protection of our native species of insectivorous birds. As an illustration of the extent to which we are indebted to our birds for the destruction of insect life, it may be stated that some species of our birds, notably, the chickadee and the wren, feed on as much as 95 per cent of insect food all year. Other species feed at one time on grain and at another on insects. Practically all birds, I think, with which we are concerned, feed on insects at some time or other, usually when rearing their young. Even our common sparrow, much maligned as it is, destroys insects during the nesting season. Insects constitute a portion of the food of nestlings; that must be so, because the nestlings cannot get sufficient protein matter from grain, consequently they have to rely on insect food. By very careful investigation in England before coming to Canada, and also here, I have been able to convince myself—apart from the accumulated observations of others which we must accept—of the immense importance of our insectivorous birds in the destruction of insect life. The encouragement of the protection of birds has, therefore, become a very important part of our work in controlling insect pests.

**Education**  
**Assists**  
**Legislation**

I realize that, although we have in most of our provinces excellent legislation to deal with the subject of protecting birds, such legislation is not infrequently practically a dead letter. What is really required is education, because, while you may have legislation, so long as you do not educate your people it is really of little use. For that reason we are trying to educate the people through the schools, by lectures and other means, as to the importance of preserving our birds.



**Bird Sanctuaries  
in Ottawa**

In this connection I can give you an instance which may be of interest to those members of the Commission of Conservation who have not heard of it, of a practical demonstration which we have recently undertaken in regard to the protection of birds. Through the Ottawa Improvement Commission and through the Department of Agriculture we have been able to declare two bird sanctuaries in the Ottawa district, the entire area of the Central Experimental Farm in one case, and the district included within Rockcliffe park in another. Throughout these wooded areas we have distributed nesting boxes, 250 in each case, and last year I was glad to see that quite a large number were occupied. There have been similar instances in other places, and it has been found occasionally that all of those distributed have been occupied the first year by birds, showing the readiness with which they take to these boxes. Now we are trying to get the farmers themselves to adopt the policy of protecting the birds around their homesteads and in the bush which usually adjoins the farm.

Thus, by educating public opinion and by demonstrating the value of insectivorous birds, we shall do very much to bring about a much better condition of affairs than exists at present. We are subject to such great outbreaks of insect pests, which are affected by the ruthless destruction of birds, that the question of bird sanctuaries is a very important one in Canada.

This brings me to the second part of what I would like to say in regard to the general question of bird sanctuaries. It seems to me that the Commission of Conservation could be of very great assistance, both as an educator of the people and as an adviser of the Provincial Governments, who, in many cases, may not fully appreciate the importance of the question of bird protection. If the governments were advised by the Commission of Conservation greater results would undoubtedly be obtained than from the advice which is freely given to them by Natural History Societies and private individuals.

**Bird Sanctuaries  
in Canada**

Regarding the question of the Bird rocks, and the protection of the cormorant on Percé rock, which Dr. Clarke has mentioned, I was only a few days ago discussing the question with Dr. Palmer, at Washington, who is in charge of the national bird sanctuaries of the United States, and he said: "I wish you people in Canada would declare Percé a bird sanctuary. There you have the greatest breeding place of one species of cormorant on the Atlantic coast," and, as Dr. Clarke has shown, it is being exterminated. I do not think there should be any trouble, if the matter is approached in the proper way, in declaring all of

these islands, Bonaventure, the Bird island of the Magdalen group, and Percé rock, as bird sanctuaries. It seems to me that that is a piece of work the Commission of Conservation should undertake and which would result not only in very great credit to the Commission but in creating a public sentiment that we need in this country. So far as I know we have not, at the present time, a single government bird sanctuary, and when you think of what the United States Government is doing in regard to bird sanctuaries, both on the Atlantic and on the Pacific, it would seem that we are falling far behind in our co-operation with them in the preservation of our native bird life. Unless we co-operate in this matter I think we are not nearly doing our duty as inhabitants of, and as trustees for this enormous northern portion of the continent, so wealthy in bird-life. The same reasoning applies to the question of the treaty or convention regarding migratory birds which is now being considered between the two Governments, upon which matter I cannot say anything at the present time, except to express the hope that we shall be able to join with the United States in bringing about this international convention for the protection of migratory birds, which includes game birds and insectivorous birds. In many cases the breeding places are in Canada and the birds migrate southwards so that wherever we have the breeding place it is of vital importance, in the interest of that particular species of bird, for us to join with the United States in its action in protecting the birds.

**Destruction  
of Fish  
by Birds**

In regard to the fish-eating habit of birds, the reason why so many of these birds are destroyed on the Bird rock and also on the St. Lawrence and on the Pacific coast, is not only on account of the greed of the "bird-lovers," as Dr. Clarke has ironically called them, who come and steal all the birds' eggs possible, but also because the fishermen, who look upon the birds as their natural enemies, destroy them. In this connection, to my knowledge, many cases have been investigated, and in the majority of them it has been shown that the birds which have been accused of feeding on the fish and destroying the fish-supply were not feeding on the species of fishes which were of edible value. The species fed upon were not food fishes, and it has usually been shown that the depletion in the number of young fishes was not caused by the presence of birds, but rather by over-fishing on the part of fishermen. Therefore, I sincerely trust that the Commission, in the near future, will seriously take up the question of bird protection, not only as it involves the protection of insectivorous birds, but also as it involves the protection of some native birds, such as gulls, and the institution of bird sanctuaries both on the Pacific and on the Atlantic coasts.

## Co-operation in Forestry

BY

B. E. FERNOW, L.L.D.

*Dean, Faculty of Forestry, University of Toronto*

THE present time is not very opportune to suggest work and expenditures which are not immediately urgent, and which can be deferred to the future without creating distress. And, I take it, most of the aims and objects of the Commission have to deal more with the needs of the future than with those of the present ; and are, therefore, of a kind that can be delayed. Yet, may we not with propriety reverse the well-known advice and say : In time of war prepare for peace. So might we emulate the brilliant example of the patriotic Dutch who, in the midst of the distress and misery of their war of liberation, more than 300 years ago, when the choice was given them, preferred to establish universities rather than to accept release from taxation, exhibiting in this the most sublime patriotism.

There are two or three suggestions in the Chairman's review of the work of the Committee on Forests which may be accentuated ; two or three directions in which progress could be made for the improvement of forestry conditions in the country even now, without any, or at least with little additional expenditure—indeed, with greater efficiency and economy as a result, by merely re-arranging matters. One suggestion refers to a re-organization of the administrative offices dealing with the Crown timber-lands of the Dominion. Another refers to an expansion of the scientific work of the Dominion Forestry Branch as a basis for future forest management. The third refers to an arrangement by which the Trent watershed, or portions of it, may come under the administration of the Dominion.

### **Re-organization Essential**

You have heard of the incongruous condition which prevails now in the administration of the public timber-lands. Three separate and independently organized government Branches divide authority over them. There is the Timber Branch, which is in charge of the licensed timber limits ; the Forestry Branch, in charge of forest reservations, curtailed, however, by the timber limits within the reservations which had been licensed before the reservations were made ; and the Parks Branch, which has charge of still other portions of the timber area. Each of these Branches works without any organic relation to the





PLANTING BLOW-SAND RIDGE WITH SCOTCH AND JACK PINE IN 1909, NORFOLK  
FOREST STATION, MAINTAINED BY THE ONTARIO GOVERNMENT



THE PLANTATION ILLUSTRATED ABOVE, IN 1914, AFTER FIVE YEARS OF GROWTH  
There are many thousands of square miles of non-agricultural lands throughout Canada  
that would yield excellent returns if similarly planted.



other, and in some cases exercising functions and dividing authority over one and the same territory. Anybody with experience in business organization will admit that this is not good business.

The Forestry Branch, a creation of the Chairman of this Commission when he was Minister of the Interior, was presumably instituted to bring into the administration, technical knowledge which was to be utilized to insure continuity of our timber resources, in so far as the Dominion controls them. Yet all, or nearly all, the timberlands which can be utilized for the next 50 years are, under the licenses in operation, withdrawn from its direct influence, indeed are being cut over without technical supervision and are gradually being added to the mismanaged lands which will be the burden of the future.

For the Parks Branch, it may be said that the lands set aside and placed under its management are to serve a different object from the economic one of furnishing timber supplies, and hence a different management is required. Yet, there is no valid reason why the different objects could not be attained under one and the same administrative agency. Indeed, it would be possible to devise a management which would serve both park and economic interests.

**Where Present  
System Fails**

The lands in this case, however, are territorially differentiated, and hence can be separately administered without much friction ; only occasionally the fact that they are under a different Branch brings inconvenience, and interferes with a uniform and economic development. But in the case of the commercial timber areas the division of authority between Timber Branch and Forestry Branch frequently leads to friction and uneconomic procedures, because the divided authority often covers the same area, namely, whenever timber limits are included in a forest reserve. This is the case with most limits in Alberta and with many elsewhere. Here, the Forestry Branch is charged with the duty of protection against fire and trespass for the timber limits themselves, as well as outside them, but has no right to interfere with limit-holders, who may be liable to trespass, or who may be responsible for fires by neglecting the prescribed conditions of logging and brush disposal. While the conditions of the timber licenses, as to cutting to a diameter limit, as to complete utilization, as to leaving the ground in good condition, including the possibility of brush disposal, are well taken care of on *paper*, the personnel of the Timber Branch being essentially composed of office men, these conditions are most frequently not enforced in the *field*.

In the territorially segregated timber limits outside the forest reservations this neglect is perhaps of little consequence, because



these lands will, for the most part, eventually be turned to agricultural use ; but those lying within the reservations become danger spots, and a handicap to the Forestry Branch in its efforts to develop a proper system of protection and better silvicultural practice.

**Definite  
Changes  
Suggested**

A rational arrangement which can be effected without much upheaval would be to place the administration of these timber limits, within the reservations at least, wholly under the Forestry Branch. There will then be a territorial subdivision of authority which will obviate the antagonisms between different policies.

In this connection the question of personnel is all-important. It will never be possible to develop a technically sound administration through political appointees. Every effort should be made to build up an organization of competent, active, *trained* men, trained for the different duties of the field work, and made permanent under civil service rules. The higher grade officials, who can secure their training at the forest schools, will have to be used as instructors in technical knowledge in order to provide short courses for the rangers who may have found entrance to the service by passing an entirely practical examination for ranger work, but are later expected to execute technical prescriptions. The main point is to make the service independent of political changes, for in forestry work, more than in any other business, persistence and permanence are essential requisites.

With such an organization and extension of the functions of the Forestry Branch in the practical field, the opportunity for systematic study and investigation of the problems of silviculture becomes possible. We are still lacking in Canada the most fundamental knowledge of the biology of our tree species upon which their silviculture is based. We are lacking volume tables as aids to timber estimating, and yield tables as a basis for calculating the results of our silviculture ; all of which the Forestry Branch will then be equipped to furnish. It will then also be in a position to do necessary experimental work and to establish demonstrations as to proper procedure in the field, by organizing systematic management of forest areas.

**Object Lessons  
in Trent  
Watershed**

One of these demonstrations, an object lesson of wide usefulness to the people of the Eastern provinces, could be made in the Trent watershed, to show how a mismanaged tract may be recuperated and become productive again. I shall not repeat the arguments advanced in the report on the "Trent Watershed Survey" as to why the Dominion Government should undertake the management of this tract. In the report, it is suggested that the Dominion either purchase the necessary area, or

else secure it free of immediate charge, under some financial arrangement with the province of Ontario. Under present circumstances the latter method will recommend itself, the *quid pro quo* to the province to consist of financial returns when the property begins to bring a revenue.

To make the matter clear, especially in its financial aspects, I may be allowed to present a tentative plan of procedure as an example. Assume that at least 100,000 acres be taken under operation. This the province is now under agreement to sell to the Dominion at 50 cents per acre. The province may prefer not to part with the land, but instead permit its use under lease for demonstration purposes free of charge, provided that eventual profits from the management, above a certain amount, be turned into her treasury.

We may assume that one-half the area contains natural growth, which, if protected against fire, and properly treated by thinnings, will grow into value, and that the other half requires artificial planting. The 100,000 acres referred to above could be selected to represent these two conditions. We have then 50,000 acres growing naturally and 50,000 acres to plant.

To place the property in shape for management and provide it with a good system of fire protection and permanent improvements, such as surveys, roads, trails, watch-towers, telephone lines, ranger houses, may be calculated to require an expenditure of \$10,000 during the first few years. A manager and five rangers would make an ample personnel, requiring an annual outlay of, say, \$6,000. The 50,000 acres, to be planted in a 50-year campaign, 1,000 acres annually, would require an annual outlay for 50 years of, say, \$6,000. Add to this an annual outlay of \$3,000 for improvement of the other 50,000 acres, and it will bring the annual charge to \$15,000.

The summing up of these quite generous initial and annual expenditures will make the cost of the property 50 years hence, with three per cent compound interest, \$1,750,000 in round numbers. Let us now look at the credit side. Long before the end of the 50-year period, the 50,000 acres of natural growth will have begun to furnish saleable material. A live manager will, indeed, find that right from the start he can secure values which will, in part, cover expenditures. But to be conservative, we may assume that only after 25 years of improvements, on an average 1,000 acres annually may be cut, yielding at a minimum five million feet B.M., which, figured even at present prices—and these are bound to improve—would net \$50,000. These \$50,000 incomes, at three per cent will have accumulated for the 25 years up to the fiftieth year to around \$1,800,000. In other words, before the 50-year period has expired the entire transaction will have

paid for itself with three per cent compound interest. Any reasonable demand of the province can then be satisfied, and there will be left 25,000 acres of improved natural growth, capable of furnishing a revenue of at least \$50,000 per year, and 50,000 acres of plantations from one to 50 years old, which when ready for the axe, say 20 or 30 years later, when the first crop is fit for cutting, may be expected to furnish additional income from the stumpage of 1,000 acres each year, of, say, at least \$300,000, pointing to a capital value of the property of \$10,000,000 which we have built up during the 70 to 80 years by an expenditure of less than \$2,000,000. This figure is arrived at, after making allowance for failures and losses and by assuming no changes in lumber values.\* It would not be surprising if twice the amount could be secured by that time.†

**What Has  
Been Done  
in France**

That these figures are not fancies but reasonable possibilities will be admitted by every forester. Moreover, we have most convincing and illuminating evidence from France that such astonishing results have been actually attained. While the figures reached in France may not be attainable by us, due to difference in labour and market conditions, the relative results show such margins that we can at least expect to make a promising approach to them.

Let me briefly cite these experiences. In the first half of the nineteenth century up to 1865, the State Forest Department planted 200,000 acres of sand dunes and placed them under management at a total expense of \$2,700,000 or \$13.50 per acre. A little less than half the area was then ceded to municipalities and private owners for \$2,745,000, therefore paying fully for the outlay, and the remaining 125,000 acres are valued at \$10,000,000. In 1901, the first cutting was made and yielded \$92 per acre from a property that had cost nothing.

**Improvements  
Carried Out**

The improvement by ditching and planting of the adjoining *Landes*, nearly 2,000,000 acres, was begun in 1837, by private interests, who, by 1857, had reclaimed 50,000 acres. Then the Government stepped in with a

\* To give an idea of the rise of stumpage values in the past we may refer to the experience of Ezra Cornell, who selected timber-lands in Wisconsin for the "foundation" of Cornell University. In 1866, he paid 60 cents per acre, or five to ten cents per thousand feet B.M. Of the 500,000 acres thus bought, one-fifth was sold for \$4 per acre, or 30 to 40 cents per thousand feet in 1873, and, by 1905, practically all the land had been sold, the last prices ranging from \$10 to \$12 per thousand. Now, white pine stumpage in Wisconsin brings \$20, and as high as \$65 has been paid for selected trees.

The poorest kind of material for box boards in New England, some as small as two inches and lengths of three to four feet, brings \$14 to \$18 per thousand f.o.b., while better grades of second growth bring \$25 to \$35 for round-edged boards.

† It must be understood that the above figures are merely tentative and could be considerably altered; yet the final result would not change in character: a decidedly paying investment.



broad-gauge plan, building roads, railways, drainage systems, making planting plans free of charge and assisting the municipalities in reclaiming the land. The State itself bought some 390,000 acres of land to enable the municipalities to accomplish the improvements. This once poverty-stricken district, which a century ago was hardly inhabited is now traversed by the densest net of railways in France.

By 1907, with an expenditure of around \$10,500,000 (\$6.50 per acre) 1,600,000 acres were reclaimed, 85 per cent in forest, of which the State owns somewhat over 100,000 acres, municipalities 185,000 acres and private owners the bulk of 1,500,000 acres. In 1898, the value of these holdings, created from nothing, was estimated at over \$96,000,000. In 1892, the average net yield was \$2.40 per acre, and since then it has been rising, so that, now, an annual income of \$8,000,000 is the result ; this from an expenditure of \$10,000,000.

The third region of extensive waste land planting is that of the Sologne near Orleans, a sandy, poorly drained plain on an impermeable calcareous subsoil, giving rise to swamps. This was once densely wooded, but, by the end of the eighteenth century, some million and a quarter acres had been devastated fully as much as our Ontario territory, and had been abandoned. A committee of private citizens undertook its reclamation, and some 200,000 acres were planted at five dollars per acre. An estimate of the value of these plantations places it at \$18,000,000, so that lands which 50 years ago could hardly be sold for four dollars per acre now bring over three dollars as an annual revenue.

The fourth district lies on the arid limestone wastes in the province of Champagne. Here, since 1830, by private enterprise over 200,000 acres were planted and prepared for management at a cost of less than ten dollars an acre. The present stumpage value is figured at from \$50 to \$100 per acre, and, yielding two dollars per acre revenue, this property is estimated at \$10,000,000.

France has, therefore, altogether 2,000,000 acres, recuperated by an expenditure of less than 15 million dollars, to now represent a capital of 135 million dollars, or nine times the outlay, and an income of around ten million dollars, or, say, seven per cent on the valuation.

#### Results in America

To assure you that on this continent similar results have already been obtained, I may cite from an official bulletin of the United States Forest Service,\* giving full details respecting the production of second growth white pine in New Hampshire and New England generally. The

\* *The Timber Pines of the Southern United States*; Bulletin No. 13, U.S. Dept. of Agriculture, Division of Forestry, 1897.

bulletin shows that such growth on third quality soil produces in 80 years, 8,820 cubic feet, equivalent to 50,000 feet B.M., and on best quality soils, more than 50 per cent more, while we have assumed in our calculations only 30,000 feet as a conservative figure.

Stumpage values actually obtained for the inferior second growth vary here from \$4.73 to \$8.48 per thousand feet. This amounts to between \$200 and \$358, or \$280 per acre on the average for 70-year-old wood, while the cost of raising the crop, including cost of land, taxes, protection, planting, etc., with four per cent interest to the seventieth year, averages \$140 per acre, leaving a net return of \$140 from land valued at five dollars per acre.

It is interesting to note that, under the market conditions in New England, even 35 to 40-year-old wood can be profitably marketed.

**Forestry a  
State  
Business**

The one thing that I wish most to emphasize with this discussion is that forestry deals with long time periods and can only succeed by well laid plans carried out persistently through long periods. Such persistency can only or mainly be expected from the State : *forestry is distinctly State business*. But only when it is divorced from politics and administered on business principles under systematic plans does it produce the astonishing results which we have cited.

It is for the Commission to see the distant future and to help inaugurate and make possible such plans, and now is the time to begin.

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## Essential Features of a Successful Fire Protection Organization

BY

H. R. MACMILLAN

*Chief Forester, Department of Lands, British Columbia*

**M**R. CHAIRMAN, ladies and gentlemen : Just prior to my departure for Ottawa, Hon. Mr. Ross, Minister of Lands of the province of British Columbia, asked me to express his great regret to the Commission that he is unable to be present, owing to the fact that the Provincial Legislature opens to-morrow.

Before presenting the paper which I have prepared, I may be permitted to refer to the remarks of Mr. MacTier and a few of the important lessons we have learned in fire protection during exceedingly bad seasons in British Columbia. The first important lesson was: that, during the past season, it would be practically impossible for any organization that could be supported from the money available from any government to have held fire losses down to a reasonable minimum in a country such as that in British Columbia, northern Ontario, northern Quebec, New Brunswick or Nova Scotia, unless such organization were founded with the means of controlling the lighting of fires. Where settlers are going in amongst the timber the only way to get control of fires is by some permit system. If settlers are free to go into the country and light fires whenever they think a fire will run best, without regard to timber, there must be danger. With no supervision they certainly will burn the forests, and our only safety this summer in southern British Columbia was the permit system. We had an extremely bad fire situation this summer for two months, and, with one man to every 300,000 acres, the permit system was the only possible safety.

### **Permits Must be Obtained**

Every person wishing to build a fire for any purpose had to get a permit from the Forest Branch. The result was we issued about 12,000 permits, and only 108 fires got away and none of them did any damage. Public sentiment on this question in British Columbia is excellent; everyone realizes that timber districts have the saw-mill on one side and the poor-house on the other. That gives us an excellent sentiment. Agriculture is only possible in many valleys if the saw-mills are kept running. Even then we had 40 prosecutions, 37 convictions, six men in jail and fines of \$50 to \$300.



I was afraid there would be a great public complaint about the obstacles we might be placing in the way of land settlement, but there was absolutely no complaint. People living in timber, recognized that they would not be exposed to the carelessness of their neighbours as they would be if there were no permits. Another thing which I have decided as being most economical is that we must protect all timber-lands.

One cannot pick up a body of temporary men, 400 or 500 in the spring, and make them understand what one wants them to protect. Of course nobody who thinks the situation over wants to protect only merchantable timber ; it must all be protected, because, if a fire starts in undergrowth, or if it is left alone and reaches such an extent as to attack merchantable timber, then when it reaches the merchantable timber it is impossible to fight it.

**Must Study  
Fire  
Conditions** We realize that, although we have better conditions than in the other provinces, with more streams and mountains and broken country, the only way is to discover fires at the start, to study the hazards, and to take measures to fight the fire when it first breaks out. The first thing we have to do is to give lots of supervision. I am sure there is more money wasted in fire protection to-day than is used economically because of lack of field supervision. Fire wardens are nearly all temporary men, and if one does not give them supervision and training, and does not try to keep the good men from year to year one cannot get the results desired. In the first fire protection services of Canada, far more wardens were wasting money than were making good use of it. Unless we have good permanent supervision of fire protection and have the same men as permanent rangers year after year we will not get the good results because we have large areas to protect with very small sums of money. Probably the most important feature, aside from the actual fighting of the fires, is public education. Most fires that occur are due to carelessness. The only fires that cannot be absolutely guarded against are those caused by lightning and they are not frequent.

**Results  
Obtained  
by Education** Most fires which we are spending money to fight are started by residents of the country in which they start. If those people had the situation put before them constantly they would not start the fires, and we have found that just by education we have been able to reduce the number of fires. We have moving-picture slides showing the danger of fires, which were shown in all the moving-picture houses. We gave away

whetstones to people with fire protection mottoes on them. We are trying to get them to understand that it is their timber that they were setting on fire.

#### OVERLAPPING OF ORGANIZATIONS A DISADVANTAGE

Another important point about fire protection organizations is that there should be only one organization in each province, excepting possibly in such cases as have developed in the Ottawa valley and the St. Maurice valley. If fire protection is good policy for the province it should be under one control all over the province. It does not appear to have been good policy to allow the persons who own timber in a certain country to decide whether or not it should be protected. I think far better results are secured when the country is treated as a whole and the expenditure is made by one body. It may be collected from the lumbermen, but it should be supervised by one body so that the timber limits and the adjoining Crown lands will all be protected by the same organization. Otherwise there must be two organizations over the whole country, one managed by the timber-license holders and the other by the Government covering the Crown timber, or non-agricultural lands covered with timber. There is, thus, fire protection for timber licensed lands and no one protecting the surrounding lands.

SENATOR EDWARDS : Have you the same possibilities of reproduction in British Columbia that there are in eastern Canada ?

MR. MACMILLAN : I think we have quite the same. Although we have not recognized it, one of the greatest assets we have in Canada in the timber business is the manner in which our native forests reproduce. Of course, in British Columbia, planting would be out of the question for many years. Even if we did not have lots of merchantable timber, on all our logged-over land, where there are no subsequent fires—that is, fires occurring after several years—the natural reproduction is excellent.

**Organizing  
a Forest  
Branch**

I have been asked to discuss the principles of organization of a Provincial Forest Branch. This is, of course, a very broad subject. We have not progressed as far in wise, businesslike forest administration in this country as might be expected of a people so dependent upon forests as we are. The reason for our comparative backwardness is to be found in public apathy—apathy founded on ignorance ; ignorance of the importance of the national interests at stake ; ignorance of the means which should be taken to maintain forest lands in productivity. I shall, therefore, discuss the problem for a few minutes

from the educational standpoint, the standpoint from which it can best be attacked by this influential Commission.

The development of a sufficient forest policy depends upon the spread of three ideas :

1. That forestry represents a commercial and economical policy.
2. That all non-agricultural land should be considered a public asset.
3. That each Government owning timbered or non-agricultural land should maintain one organization charged to study the possibilities of those lands, and to protect and administer them accordingly.

**Forestry Not Understood**

There are an astonishing number of people in this country who misinterpret the term forestry, and oppose any extension of forest administration because of that misinterpretation. Such people believe that forestry is a conceit of sentimental persons who desire to protect woodlands, to prohibit the cutting of trees ; that it has its place only in parks, where commercial operations are not contemplated. Or they may believe sincerely that forestry involves the expenditure of a great deal of Government money in the planting or cultivation of forests, expenditure which could never be repaid either as to capital or interest. Still another misconception of forestry exists in the minds of many persons connected with the lumber industry, who believe that a forest department would import from Europe or elsewhere absurd regulations requiring the planting of a tree to replace every one cut, or of hedging logging operations about with killing restrictions. Such conceptions are of course founded on misinformation. They are nevertheless prevalent, and are responsible for the fact that Canada is now, of all the countries dependent largely upon forest industries, doing the least for the protection of the timber-lands.

**Business Conditions Govern**

These false interpretations of the term "forestry" must be met and overthrown if public support is to be secured for a forest policy. The arguments with which they can be met are the arguments that appeal to the business man. Timber must be cut whenever and wherever there is a market for it, wherever and whenever the cutting of it employs labour and supports profitable industries. No expenditure should be made on fire protection or forest administration, which will not be returned both as to principal and interest by the produce of the land to which the expenditure is devoted. The lumberman or logger who fears



the effects of forestry should be made acquainted with the manner in which forest policies have met the needs of industry in the Western States or British Columbia, where many millions of feet of timber have been sold to operating companies without any trouble over the adoption of regulations.

The British Columbia Forest Branch alone has sold several hundred million feet of timber to loggers during the past two years, under regulations requiring clean logging, and such disposition of slash as will prevent the accumulation of a dangerous fire hazard and will encourage the regeneration of the forest. There has been no trouble with the logging industry over the adoption of such a policy ; rather, it is supported by the industry. The important point is that regulations are as few, as simple, and as economical as possible. They are framed with a knowledge of the logging conditions of the particular area to which they are to apply, and their estimated cost is allowed for in setting the price for the sale of the timber. The cost of the regulation falls upon the public in the case of such timber sales, which is of course proper, as the regulations are designed for the public benefit. The logger or timber owner, therefore, has nothing to fear from forestry.

#### CANADA DEPENDENT ON FORESTRY

The proper interpretation of forestry, and what it actually means to Canada, cannot be stated too frequently. The future of this country depends upon our making every acre productive. Broadly speaking, the earth's surface can be made productive in two ways only, by producing agricultural or timber crops. South of the 60th parallel, about 69 per cent of the area of Canada is unsuited for agricultural crops. A very large proportion of this non-agricultural land is suitable for the production of merchantable timber. The production of forest products has been and will always be one of our chief industries. At the present time forest industries supply 12 per cent of our foreign trade, 16 per cent of our railway traffic, and equal in value our annual wheat crop. We have a choice to make. Shall we let these valuable industries perish for want of raw material, or shall we perpetuate them by protection of our present mature timber from fire, by protection of the young forests on our non-agricultural lands, and by the logging of our forests in such a manner as to encourage the reproduction of valuable forests ? The perpetuation of these industries and their source of raw material by the investment of such expenditure as the anticipated crop will warrant is forestry.

**Non-Agricultural  
Lands**

Optimistic as we have been in this country, we seem to have been unable to see any value worth caring for in our non-agricultural lands. Our vision was broad enough years ago, when we heard of agricultural lands in the Peace River valley, to recognize that such lands, while unused at the time, would within a decade or two grow crops and support a population. We can look across the future to the time when our far northern mineral deposits, though inaccessible and incapable of development at the present time, will develop centres of industry. But we travel daily across the non-agricultural, logged areas and burned-over lands which surround many of our most densely settled communities and lie across our transcontinental railways and we see in such lands no asset. This attitude is both dangerous and unfair to the country. We must realize that our present stands of merchantable timber cannot support our growing industries indefinitely. The growing American demand for forest products, to which in a very few decades will be added a much greater market in Europe than now exists, will very rapidly wipe out our eastern merchantable forests. Even now, New Brunswick, speeded up by foreign markets, is cutting each year from Crown lands more than the annual forest growth.

**Problem Must  
Be Faced**

This is a problem which must be faced squarely by every province. The future forest industries, which are almost the only industries possible on three-fifths of the area of Eastern Canada, must be supported by the timber grown on the logged-over and burned-over non-agricultural lands. Looking at these lands we should see, not wastes, holding no promise for the future, but productive lands, needing only protection from fire to enable them to support logging camps, pulp mills, rural and industrial communities of a type which has done much for Canada. If the young forest growth on the non-agricultural lands of Eastern Canada had been protected from fire during the past twenty years, railways would not now be importing railway ties, and saw-mills in Western Ontario, each the centre of a thriving community, would now be supplying the markets with lumber, which, because of lack of forest protection in the past, is being supplied from British Columbia and the United States. Many instances may be quoted which show that care of the young forest on non-agricultural lands is not only a duty we owe to posterity, it is an insurance of timber industries which affects the prosperity of Canadians to-day. Even agriculture will benefit by such a policy, for scattered through our non-agricultural regions are very many small areas of agricultural and semi-agricultural land which can only be developed if some-

where in the neighbourhood the farms can find such a market for labour and produce as the timber industry affords.

**Investigations  
Required** The continuance of investigations, similar to the study of the Trent Valley watershed, by the Commission of Conservation, will have undoubted effect on the popular valuation of our non-agricultural lands. When it is shown that such lands will in 70 years produce a timber crop worth \$96.00 per acre, provided a fraction of a cent per acre per year is expended in fire protection, the public will readily support the fire protection policy.

### PROPORTIONS OF NON-AGRICULTURAL LANDS

The importance of timber industries to Canada, and the certainty that such industries cannot be permanent unless the growth of another crop of timber is assured, makes the practice of forestry imperative as an economic measure. Every section of the Canadian public is interested. Roughly, the proportion of non-agricultural land in Canada south of the 60th parallel is : Nova Scotia, 81 per cent ; New Brunswick, 72 per cent ; Quebec, 76 per cent ; Ontario, 64 per cent ; Dominion Lands, 51 per cent ; British Columbia, 85 per cent. Some of these Governments already have forestry departments ; none can afford to be without some forestry organization, charged with the study, protection and administration of timbered and non-agricultural Crown lands. Such lands should be studied in order that the protective and administrative measures adopted may be decided with a full knowledge of the value of the products to be expected from the land. In this way expenditure is avoided on inaccessible and non-productive land which will not yield returns, and the investment is made on those lands where quality and situation guarantee a profitable crop. In each province the area of timber-land is very great. The conditions of forest growth, of fire hazard, of utilization, are so variable that no rule of thumb methods may be safely adopted. The Forest Branch must include men trained to, and free to study, each of these problems, in order that loss of revenue may be prevented, and the most economical possible scheme of administration and protection worked out for each section of the country.

**British  
Columbia's  
Experience** Our experience in British Columbia has been that the best results are secured at the least expense where the one organization, call it "Forest Branch" or "Timber Department," is responsible for the necessary forest studies in fire protection as well as the routine, but highly technical,



business of timber administration. There are several advantages in such a consolidation of work. The first is the reduction of overhead cost. The head office looks after all work. One field organization serves all purposes. Frequently one man in a district performs various duties as ranger, in charge of scaling, supervision of logging, or fire protection. This form of organization coincides with the seasonal character of forest work. The rangers who supervise logging in the winter are at the same time becoming acquainted with the fire hazards in their districts, and are, therefore, the best men available to supervise patrol and fire protection work in the summer. It is thus possible to give good men permanent employment and to offer them incentives for doing good work in a manner which would be impossible if the men were employed for summer work only. This increase of trained, permanent men, which is economically possible only where the one organization handles the protective and administrative work, is the important feature of our present work in British Columbia. Other obvious advantages of such an organization are that all the timber-land, whether forest reserves or not, is under the one administration; the whole organization in any district is available under one head for any emergency work, and the experience and knowledge of the country gained by a man in one branch of the work serves him in other branches of the work. The retaining of the best men from year to year makes possible the development of the expert forest ranger, a man experienced in the timber business of his district, in scaling, fire protection and fire fighting, without whom no efficient forest administrative organization can exist.

**Must Look  
to Future**

I believe that everything that I have said here is self-evident. The man on the street would come to the same conclusion if he had the facts before him and gave a few hours to thinking them over. The trouble has been that the man on the street, the Canadian at his business, has not been worrying over the raising of another crop on our timber-lands. The Commission of Conservation is in an excellent position to start him thinking and I am confident that this Commission, together with the various Forest Branches in Canada, need only make a few studies and place the situation in concrete form before the public to ensure that, in a few years, public timber-lands will be studied, protected and administered in such a way as to maintain their productivity, and to guarantee to Canada permanent forest industries.

I wish to take this opportunity of expressing my appreciation of the valuable assistance which the Commission of Conservation

has rendered to the British Columbia Forest Branch, in taking part in a forest survey of British Columbia, and in studying the regeneration of the forest on the logged-over and burned-over lands of the Coast districts. The co-operative spirit, which this Commission has shown, has been a constant influence in forming public sentiment and in securing the information which must be the basis of wise forest administration.

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SENATOR EDWARDS : I desire to compliment the gentleman who has just delivered his address. He is a young man, but it is one of the best addresses I have ever heard on the question. I want to give him a word of advice : Let him not go into politics, because if he does he will become Premier of Canada.

SIR CLIFFORD SIFTON : We are very pleased to have Mr. Mac-Millan with us. I wish to put myself on record as saying, that while not an expert on the matter that has been discussed just now, it is perfectly clear that British Columbia is doing perhaps better than any other province in the Dominion at the present time in regard to fire protection and taking care of her forests. It is pretty clear that they are spending their time and money and are working at the problem in a serious way. In connection with our own work they have shown the most liberal and reasonable spirit in co-operating with us. I had occasion to-day to write to Sir Richard McBride and I expressed to him my thanks on behalf of the Commission for the way in which his Government has co-operated with us.

## Water and Water-Power Problems

BY

ARTHUR V. WHITE

*Consulting Engineer*

THE Commission of Conservation, in the important section of its work which deals with the waters of Canada, finds it necessary to direct special attention and effort toward certain questions which, from time to time, arise respecting the actual, or proposed, uses of Canadian, and also of International or boundary waters. Such enquiries demand a considerable expenditure of time, which is essential to a proper consideration of the issues involved.

When reliable information is received, to the effect that the rights to a certain water asset are being sought after with objects which it is apprehended may not inure to the best interests of the public, the Commission at once sets about collecting all the available facts bearing upon the subject, thus preparing to take intelligent action in the matter should occasion require.

With your permission we shall briefly consider a few representative water problems which have been requiring attention, and upon which my time is more particularly occupied.

### LONG SAULT RAPIDS, ST. LAWRENCE RIVER

As is known, the Commission has devoted considerable attention to the navigation and other features of the Great Lakes and St. Lawrence River route with a view to ascertaining how this great water highway may be affected by proposed development works of various kinds ; such, for example, as the power project suggested for the Long Sault rapids.

In its report on this subject, the Commission drew special attention to the fact that the charter granted by the state of New York to the Long Sault Development Co. has been declared, by the Governor, and by the Attorney General of the state, to be unconstitutional. In consequence of which finding the state annulled the charter.

Activity of  
Development  
Company

Now, after a year or more, during which it might have been thought that the Company had ceased its activities, we find in the October term of 1914, that the Long Sault Development Co. filed an application





ICE CONDITIONS ON THE ST. LAWRENCE, NEAR CORNWALL, ONT., IN 1914  
 A dam across the St. Lawrence river would undoubtedly  
 be a serious menace.



with the Supreme Court of the United States, which, in effect, requested the privilege of re-opening its case before that tribunal, the object being to re-establish its status with respect to its former charter.

Canada's interests are very likely to become intimately associated with any movement that may be made in a matter of this kind, and this action, therefore, necessarily calls for careful observation and study, especially when such advances are made by a corporation so powerfully supported as is the Long Sault Development Co.

**Ice Conditions,  
Long Sault** This Commission, when reporting upon the Long Sault project, drew attention to the great danger which, because of the ice conditions, would assuredly follow the erection of a proposed dam at the Long Sault. This matter has been kept under consideration, and, when phenomenal ice conditions have occurred in the river, effort has been made, and will continue to be made, to obtain first hand knowledge of these phenomena.

#### INTERESTS STILL SEEKING UNDEVELOPED WATER-POWERS

The large power interests, especially in the United States, are untiring in their efforts to get control of undeveloped power sites, in order to hold them against that day in the future when the public will be dependent upon the actual development of these sites.

Funds are available for procuring these undeveloped sites, even to the detriment of actual development work on sites already acquired. It has been authoritatively stated that the concentration in ownership of water-powers in the United States has increased in the last five years about seven times faster than power development.

This Commission endeavours to discern the *bona fides* of private or corporate interests seeking the control of large water-powers in Canada, and, if necessary, it recommends, in connection with applications, such action as will protect the public interests.

**Statement by  
Mr. Pinchot** On December 16, 1914, at the Hearings at Washington on the proposed new *Water-Power Bill* designed to provide for the Federal administration of the water-powers of the United States, Mr. Gifford Pinchot, when appearing before the Committee dealing with the Bill, made the striking statement that : "during the last two years the large group of water-power interests increased their control of undeveloped water-power in the United States by 2,050,000 horse-power." He, further, stated that :



"In 1911 the ten greatest groups had developed and under construction 1,821,000 horse-power ; and in 1913 they had 2,711,000—an increase of 890,000 horse-power. In 1911 the ten greatest interests held undeveloped 1,450,000 horse-power, which had risen to 3,500,000 in 1913—an increase of 2,050,000 horse-power in two years.

"These figures show that in the last two years the great power interests have increased their control of power held undeveloped more than twice as fast as they have increased their control of developed power.

"The same preference of the water-power interests for concentrated control, rather than for development, may be shown in another way.

"In 1908, the total developed water-power in the United States was, in round numbers, 5,400,000 horse-power, and in 1913, it was 7,000,000, an increase of about 33 per cent for the five-year period. In 1908, the thirteen greatest groups of interests controlled a total of 1,800,000 horse-power developed and undeveloped, while in 1913 a smaller number—ten—of the greatest groups controlled a total of 6,300,000 horse-power developed and undeveloped, an increase of 240 per cent. Thus, concentration in ownership of water-power in the United States has increased in the last five years about seven times faster than power development.

"These figures show that instead of spending their money to develop the power sites they had, the great water-power interests have been spending the money to acquire and to hold power sites undeveloped, to meet not a present, but a future demand. The concentrated control of the undeveloped power sites of the country appears to have been their object. The very men whose control of undeveloped water-power increased by 2,050,000 horse-power in two years are now complaining without a shred of justification, except what they themselves produced, against the hampering of water-power development."

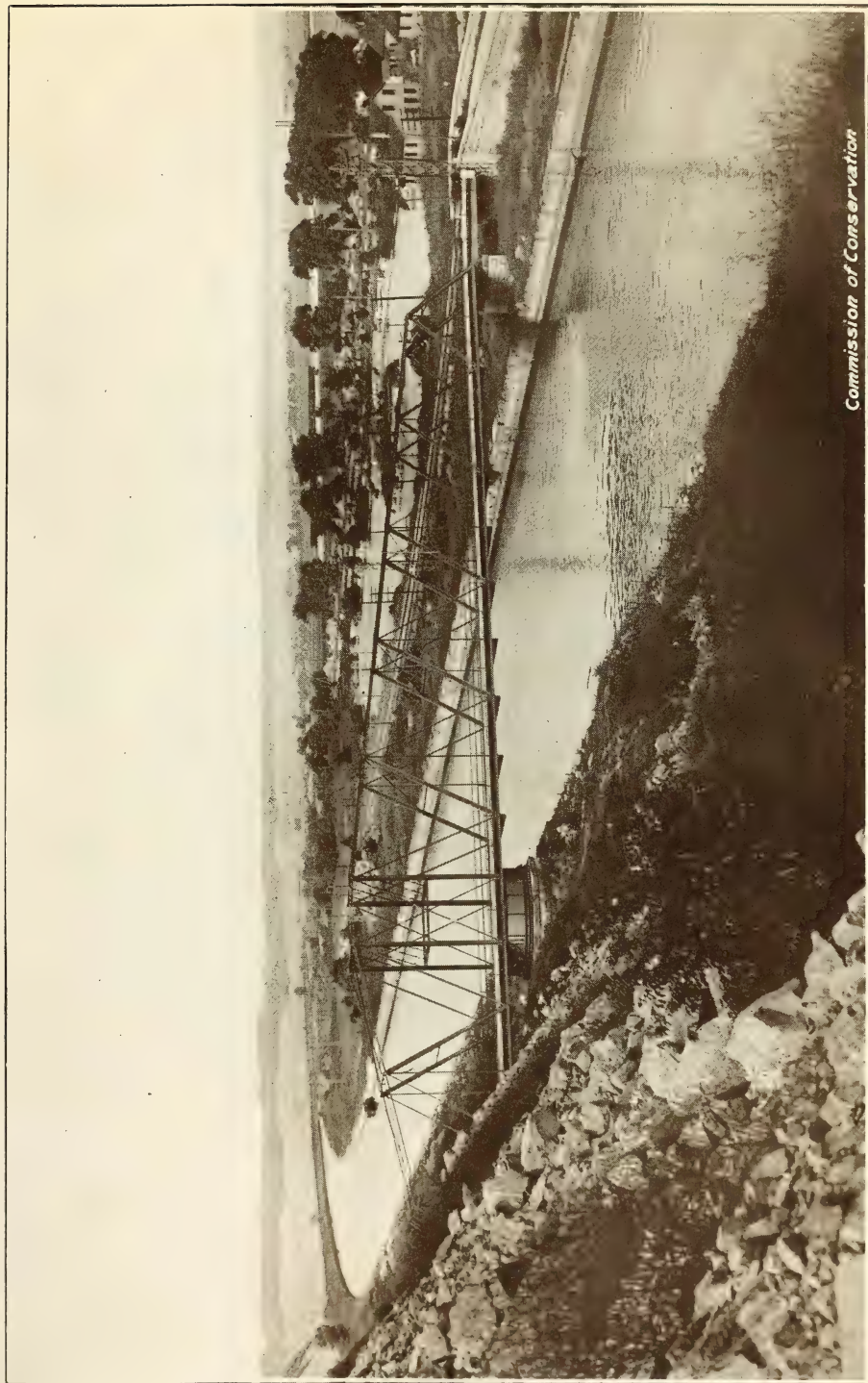
#### WATER DIVERSION BY CHICAGO

About two years ago the Sanitary District of Chicago applied to the Secretary of War for permission to increase the amount of water thitherto authorized by him, to withdraw from lake Michigan, namely, 4,167 cubic feet per second.

The Secretary of War held public Hearings in Washington, at which formal protest was fyled on behalf of Canada, and also a separate protest from the Commission of Conservation, the Commission having been specially requested to render its assistance.

The Secretary of War in his official Decision stated that the diversion of 10,000 cubic feet per second from lake Michigan, as applied for in the petition of the Sanitary District of Chicago, "would substantially interfere

Decision of  
Secretary of War



*Commission of Conservation*

CHICAGO DRAINAGE CANAL,  
Showing the great curve through the rock cut.

*Courtesy, Mr. G. M. Fisher*





with the navigable capacity of the navigable waters in the Great lakes and their connecting rivers ;” and he emphasized “that the provisions of the Canadian treaty for a settlement by joint commission of ‘questions or matters of difference’ between the United States and Canada offer a further reason why no administrative officer should authorize a further diversion of water, manifestly so injurious to Canada, against Canadian protest.”

The decision rendered by the Secretary of War was along the lines of Canada’s contention. The Sanitary District of Chicago, however, has not respected the finding of the United States War Department. In consequence of this disregard of authority, the Attorney General of the United States has brought action in the District Court of Chicago, seeking an injunction to restrain the Sanitary District from violating the law as is at present being done.

It has been stated that, at times, more than double the authorized quantity of water has been diverted.

#### **Actions Now Pending**

There are now really two actions pending ; the first, praying for an injunction to restrain the Sanitary District from constructing the proposed Calumet-Sag channel, designed to connect the main channel of the Sanitary District with the Little Calumet river, with the object of reversing the flow of the Calumet and Little Calumet rivers, thus diverting additional water from lake Michigan.

The Attorney General of the United States, in his Complaint upon this action, states :

“That the defendant has announced its intention to construct and maintain the said proposed Calumet-Sag channel, to reverse the flow of the said Calumet river and the said Little Calumet river as aforesaid, and to divert and abstract waters from lake Michigan as aforesaid, notwithstanding the refusal of the said Chief of Engineers to recommend the same, and notwithstanding the refusal of the said Secretary of War to authorize the same, unless restrained by a court having jurisdiction to restrain said action, and to that end its Board of Trustees, on the eighteenth day of September, in the year 1907, adopted and passed an order, which is still in full force and effect,” and further ;

“That the defendant, on the sixteenth day of October, 1907, actually began the excavation of the said proposed Calumet-Sag channel, at the westerly end of the same, with a force of men under the supervision of one William M. McCartney, its assistant engineer, and your orator is informed and believes, and so charges the facts to be, that the defendant intends to, and will, continue and complete the construction of said channel, reverse the flow of the said Little Calumet and the said Calumet rivers as aforesaid, and divert and

abstract the waters of lake Michigan as aforesaid, and maintain said channel as aforesaid, to the manifest and irreparable injury of your orator and its interstate navigation and commerce, unless restrained by the injunction of this honourable court."

The other action seeks an injunction to restrain the Sanitary District from diverting or abstracting any waters from lake Michigan "over and above and in excess of 250,000 cubic feet per minute (4,167 cubic feet per second) as already authorized by the Secretary of War."

The Attorney General, in his Complaint on this issue, states that:

"Your orator further represents that defendant has for a long period of time diverted and abstracted from lake Michigan and caused to flow through the Chicago river and is at the present time diverting and abstracting from lake Michigan and causing to flow through the Chicago river from 400,000 to 600,000 cubic feet of water per minute, which amount is greatly in excess of the amount so permitted to be diverted and abstracted from lake Michigan to flow through the Chicago river by said Secretary of War as hereinbefore set out and is in direct violation of the permits of said Secretary of War which limits the said flow to 250,000 cubic feet per minute ; that defendant plans, intends and threatens to continue to divert from lake Michigan through the Chicago river from 400,000 to 600,000 cubic feet per minute in violation of the permits and orders of the Secretary of War."

and :

"Your orator further represents that the Congress of the United States has not authorized the diversion of any such waters through the Chicago river, and that the Chief of Engineers has not recommended the said diversion of waters through the Chicago river in excess of 250,000 cubic feet per minute, nor has the Secretary of War authorized the diversion of the waters of lake Michigan through the said Chicago river in excess of 250,000 cubic feet per minute, but on the contrary has refused so to do, and has refused to authorize the diversion of any of such waters in excess of 250,000 cubic feet per minute through said river, as is more fully set out in paragraph fifteenth hereof, and that the total amount of water which said defendant can legally divert or abstract from lake Michigan in any manner cannot exceed 250,000 cubic feet per minute."

and again :

"Your orator further represents on information and belief that the diversion and abstraction of the waters of lake Michigan into the Chicago river in excess of 250,000 cubic feet per minute has lowered and will continue to lower the level of the water of lake Michigan, lake Huron, lake St. Clair, lake Erie, lake Ontario, Sault Ste. Marie, St. Marys river, St. Clair river, Detroit river, Niagara river, St. Lawrence river, and all the harbours, channels, canals and rivers connected therewith, all of which are navigable waters of the said

United States, and will thus injure and diminish and create an obstruction to the navigable capacity of all said waters."

It will have been observed that, in the instance of the Calumet-Sag complaint, it is definitely stated that: "Notwithstanding the refusal of the said Chief of Engineers to recommend the same, and notwithstanding the refusal of the Secretary of War to authorize the same," the Sanitary District has proceeded with the works of construction for which it has not secured the required Federal authority. This conduct on the part of the Sanitary District corresponds to that manifested with respect to the illegal diversion of water in excess of 4,167 cubic feet per second authorized by the Secretary of War and is conduct against which Canada strongly protests.

**Power  
Development  
at Chicago**

When making its protest the Commission of Conservation drew attention to the special inducements growing out of the development of water-power which Chicago had in mind when seeking extra water diversion. The Commission at that time did not have before it the facts regarding the profits on this power. In this connection it is now interesting to note that, in 1914, when the Sanitary District made its reply to the Complaint of the Attorney General, the District stated, with regard to this power development, that it has:

"constructed also certain works for utilization of water-power at Joliet; that the water-power so developed is approximately 30,000 horse-power; that each horse-power is worth approximately \$30.00 per year, net, as developed at Joliet; that this defendant expended in the construction of the said water-power development approximately \$5,000,000; that if the flow of the said main channel of the Sanitary District were limited to 4,167 feet there would be little, if any, power developed or available at Joliet. That this defendant now sells and disposes of the electrical energy developed as aforesaid by its works at Joliet, Illinois; that such revenue is used for the purpose of partially defraying the other expenses of this defendant."

At \$30 per year net, 30,000 horse-power represents a revenue of \$900,000.

While the Commission of Conservation has been unable to follow the present cases in detail, nevertheless sufficient attention has been given so that the general course of events is well understood. Seldom have so many prominent technical engineering experts been assembled as in this case. The testimony already amounts to seven large volumes comprising over 4,500 printed pages, and, in addition, many maps and plans. The exhibits in this evidence include the protest of Canada, as well as that of the Commission of Conservation.



One point in connection with this matter of the diversion of water at Chicago which is worthy of note is : that there is definite statement on the part of the United States Federal authorities that protests made by Canadians weighed materially in the deliberations which led up to the definite denial of the Petition of the Sanitary District of Chicago.

### NIAGARA POWER SITUATION

A complex situation exists along the Niagara river, more particularly in the vicinity of the Falls.

Since the ratification of the Boundary Waters Treaty, a number of bills, relating to hydro-electric development on the Niagara river, have been presented to the Congress of the United States.

Two such bills have been under special consideration by the Committee on Foreign Affairs. One of these bills has been introduced by Representative Chas. B. Smith of the state of New York, and the other by Representative Cyrus Cline of Indiana, who is also chairman of the sub-committee on Niagara legislation.

Of the various bills introduced, the provisions of the two just mentioned are the more important, and, if enacted into law, without being modified, will be of serious import to Canada. Such bills have one very important aspect, namely, if enacted, they are of force in the United States even though the treaty relating to boundary waters should lapse.

There are two features common to the Smith bill, and to the Cline bill, which more immediately affect Canada. These are : (1) The exportation of electricity from Canada to the United States ; and, (2) the quantity of water which will be permitted to be diverted from the Niagara river for power purposes.

During the year just passed it has been necessary, on more than one occasion, to prepare memoranda dealing with these subjects, and some of the statements appearing in such memoranda may here be made use of.

Before proceeding with our brief survey there are one or two matters related to the legislation now pending at Washington, which should be held in mind. One of these is what we may term the "Doctrine of Equal Benefits."

When the International Waterways Commission has deliberated upon such matters, the opinion has repeatedly been expressed, that

the division of boundary waters and the benefits therefrom, should be based upon the doctrine of equality. It was represented that neither Canada nor the United States desired to be forced into circumstances which made for inequality of benefits, without receiving adequate *quid pro quo*. Thus, with respect to electrical energy, one fundamental subject laid down for consideration by the Commission was :

“The transmission of electric energy generated in Canada, to the United States, and *vice versa*.”

The present International Joint Commission, in some of its opinions, has been pronounced in giving expression to this same principle, or doctrine, of equal rights and benefits.

#### Question of Jurisdiction

One other point involves the question of the extent of the jurisdiction of the International Joint Commission, with respect to certain diversions of water above the falls. Both the Smith bill and the Cline bill contain provisions which involve a raising of this question.

A careful reading of the Boundary Waters Treaty will show that the International Joint Commission has jurisdiction over the Lower Niagara river. It would appear, however, that the authors of the bills, as well as certain other persons, assume that the Commission is without jurisdiction for certain diversions *above* the falls.

#### Plant Efficiency

This subject of jurisdiction may involve the right to utilize the additional 100 feet of head existent in the Lower Niagara river. And, in this connection, both the Smith bill and the Cline bill contain provisions relating to efficiency of plants ; to the possible enforced abandonment, at the order of the Secretary of War, of the present power developments at Niagara Falls on the United States side of the boundary, and the replacement of these plants by others utilizing the water under the combined head obtainable from the falls and the rapids of the lower river. This is an important subject, if only because companies in the United States—notably the Niagara Gorge Railway Co.—appear to be awaiting an opportunity to make diversions from the Lower Niagara river. It would be profitable to consider to what extent either of the bills would afford opportunity for companies to attempt to exercise rights of diversion upon the water of the Lower Niagara river. In this connection the remarks of the late Secretary of War, before the Committee on Foreign Affairs in February, 1913, are notable.

**Expiration of  
Burton Act**

Another point to be remembered is that the Burton Act, which restricted both the diversion of water and the importation of electricity into the United States, expired about a year ago. The Burton Act provided for the granting of permits for 15,600 cubic feet of water per second. The Boundary Waters Treaty provides for an allotment to the United States of 20,000 cubic feet of water per second. Permits for the difference, 4,400 second-feet, have not yet been granted. This surplus water is much coveted by the state of New York, by the existing power companies, and by other interests. A knowledge of this fact throws light on certain phases of the legislation proposed in the bills sponsored by Representatives Smith and Cline.

**UNITED STATES FEARS THAT CANADIAN MARKETS MAY ABSORB  
ELECTRICITY**

An avowed object sought by some of these measures, is *the importation into the United States of increased quantities of electric energy generated in Canada*. It is abundantly evident that the motive prompting the *early* passing of legislation is the fear that the longer the delay that occurs in actually receiving electric energy from Canada, the less will be the amount that may be so received ; because Canada, owing to her growing manufactures and demands, is rapidly absorbing the surplus energy which is coveted chiefly for the state of New York.

**Confirmatory  
Testimony**

Consider some confirmatory testimony upon this matter. Lieut.-Col. J. C. Sanford, reporting on January 6th, 1913, upon the subject of Niagara power, to the Chief of Engineers, United States army, states :

"There is no question but that Niagara power will soon be utilized to the fullest extent allowed by governmental restrictions. If advantage of the power, generated in Canada, cannot be had on the American side, manufacturers will be attracted to Canada by this cheap power, and the industries of this country will suffer accordingly. The effect of present restrictions on the importation of power is becoming noticeable. . . . Manufacturers at present contracting for additional Niagara power must locate and are locating in Canada. It, therefore, seems advisable to permit immediately the importation of Niagara power to the fullest extent permissible under the law, and, other things being equal, to grant permission for its importation to the company or companies which will make the earliest use of such power."





POWER HOUSE AND TRANSFORMER HOUSE, CEDARS RAPIDS, ST. LAWRENCE RIVER  
Cedars Rapids Manufacturing & Power Co.



The former Secretary of War, Hon. Henry L. Stimson, before the Committee on Foreign Affairs, recently stated that :

"The investigation which has been made by the engineers indicates that Canada, if we do not take it, will use the entire amount that the treaty permits in a very brief time, so that whatever effect any restrictions on importations would have, would not protect the falls for more than a very brief period, and it would result in giving to Canada, very possibly, a large number of industries which otherwise would be established on this side of the falls."

When Representative Chas. B. Smith was speaking on behalf of his bill, he submitted, before the Committee on Foreign Affairs, a letter from a leading citizen of Buffalo, in which it is stated :

"Every restriction on the importation of Canadian power should be at once removed. Electrical power is a *raw material and should be free.*"

The sub-committee on Niagara Falls power, appointed by the Committee on Foreign Affairs, in their report on one of the Cline bills, state that it had been urged for their attention :

"That the Canadian companies were rapidly increasing their sales and would very soon take the full amount of water they were entitled to and the United States ought to get what power it was able to *now.*"

and they add :

"If the advancement in the development of power on the Canadian side increases for another year or so—and it is not apparent to the Committee that it will not—then the Committee concluded that it was proper to take as large an amount as it could get for consumption in the villages, cities, factories and homes along our border."

Representative Chas. B. Smith, of the state of New York, in conversation, stated to me, that he favoured no restriction on the importation of electricity, because if it was good for the United States to have this commodity he thought it was advisable to get as much as possible, and permit it to come into the country without any restriction. This view of Mr. Smith is amply reflected in certain bills of his which provide for no restriction.

#### U. S. Market for Electricity

In the state of New York there is a ready market for additional electric energy. The Opinion, delivered on February 12th, 1914, by the Public Service Commission of the state of New York, states :

"That there is a large shortage of electric power in western New York with a strong demand for greater supply which is not being met by existing companies. . . . We are using all



the power made on the New York side, and all that has been brought from Canada, and the demand for more power in western New York is insistent and being urged with great force."

It is also stated that Niagara Falls power produced in the United States is so far from supplying the needs of portions of the state of New York, that if the importation of power were prohibited it "would plainly amount to a great public calamity."

It is most definitely affirmed that there is present demand for additional electrical energy on the United States side of the boundary, and, in consequence of this market, strenuous efforts, especially during the last two years, have been made to secure as large an amount of power as possible from the Canadian side. By so doing vested interests may be created, and thus make it difficult, if not impossible, for Canada ever to use this power without the risk of serious international differences.

#### INTERNATIONAL COMPLICATIONS POSSIBLE

Canada, naturally, desires to avoid contributing to any circumstances which might have within them the possibility, later, of creating difficulty with any foreign nation, and especially any difficulty with the great nation on her southern border.

The chief danger lies, not with the people themselves, but with the aggressive conduct that may be pursued by strong commercial interests as soon as they are convinced that their assets are jeopardized.

In the Opinion rendered by the Public Service Commission of New York, the Commissioners state :

"We have nothing before us but the suggestion that the Dominion of Canada may, at some future time, forbid this exportation. This Commission must assume that international relations affecting so important a subject as the means of continuing great industries which have grown up in reliance upon the use of this imported power, and, as well, the interests of the Canadian producing companies themselves, have become fixed and subject only to such changes as will fully protect the great commercial and industrial interests and rights now served by this power brought from Canada. The time has long since passed when governments proceed ruthlessly from pure national rashness or anger to destroy the settled accepted commercial relations and formally vested rights of persons and corporations."

Elsewhere the Commissioners also state that :

"In deciding these cases the Commission must assume that relations between Canada and the United States affecting the means of continuing great industries which have grown up in reliance upon the use of electric power imported from Canada, and as well the

interests of the Canadian electric producing companies themselves, have become fixed and subject only to such changes as will protect the great commercial and industrial interests and rights now served by electric power brought from Canada ; and particularly so as in these cases it appears that the percentage of export power to plant capacity is the same as has been and is allowed by Canada to other exporting electrical companies."

**Purpose of  
Certain Interests  
in United States**

The Burton Act empowered the issuance of *revocable permits* for the transmission of additional electric energy from Canada into the United States, and it may further be emphasized that the Canadian measure—the *Fluid Exportation Act*—provides that licenses for the export of power from Canada are also revocable. What, then, is the real import of a statement such as is recorded by the Public Service Commission of the state of New York ? It, in effect, proclaims that the people of New York need not be concerned about permits and licenses, revocable or otherwise. It states plainly that, if they can only succeed in once getting this electric energy from Canada into the United States, and have it distributed so that their citizens and industries become dependent upon it, then Canada could not hope to alter these conditions. In the words of the Commissioners, the conditions in the state would "have become fixed, and subject only to such changes as will protect the great commercial and industrial interests and rights now served by electric power brought from Canada," that is to say, as will protect "the great commercial and industrial interests and rights" in the United States.

Some years ago when the relations of the United States with Canada were under discussion before the "Select Committee on Relations with Canada, of the United States Senate," Mr. Joseph Nimmo, Jr., addressed the Committee with respect to the possibility of Canada dealing with her transportation facilities in a manner such as, adversely, to affect interests in the United States using Canadian transportation, and stated that :

"In the entire range of our Canadian relationship, from Halifax to Vancouver, the United States holds an overpowering advantage over Canada, and at every point. The suspension of the transit trade would be of comparatively small disadvantage to the United States, whereas it would be utterly disastrous to Canada. . . . It is high time for the people of this country to appreciate the fact that their National Government holds a preponderance of commercial power on this continent as absolute as the preponderance of its military power, and to demand that those who are charged with the affairs of government shall adopt such measures as shall prevent any interference by a foreign power with the course of the development of our domestic or foreign commerce."

In connection with the exportation of electricity, Canada certainly does not desire to assist in creating any circumstances which would even tend to invite a possible carrying out of any such policy as is suggested by the language in the Opinion delivered by the Public Service Commission of the state of New York, or in the address, just quoted, as delivered at Washington before the Select Committee of the Senate on Relations with Canada.

When the diverse and powerful financial interests which are represented in these great Niagara developments are scrutinized, no question remains as to the absolute necessity that we possess such a knowledge of the facts as will insure the adoption of a wise administrative policy respecting the hydro-electric power developments at Niagara.

#### INVESTIGATION BY INTERNATIONAL JOINT COMMISSION AT LAKE OF THE WOODS

On the Lake of the Woods watershed, comprising an area of over 26,500 square miles, and embracing the International boundary between the province of Ontario and the state of Minnesota, the International Joint Commission has, for over two years, been conducting a special investigation. The chief purpose is to ascertain to what extent the waters of the lake of the Woods may be regulated by storage in the various large lakes in the watershed, and what particular regulation would be most desirable in the interests of all parties dependent upon the use of these waters.

It was requested by the Canadian Commissioners that I be permitted to assist the International Joint Commission on this important work. Through the courtesy of the Commission of Conservation, arrangements were made for me to have such time as would be necessary to fully attend to this investigation.

Mr. Adolph F. Meyer, an engineer of St. Paul, Minnesota, and formerly of the United States Engineers' staff, was appointed by the United States section to represent their Government. Mr. Meyer and myself have jointly carried forward the work, both in field and office. This Lake of the Woods investigation has proved a heavy undertaking. Extensive surveys have had to be made and during each of the last two seasons the field parties comprised about forty men, and, at the present time, some fifteen or more men are working in offices at Toronto and St. Paul.

This matter is here mentioned, specifically, because of its importance, and also, because it has taken a great deal of time and effort. In prosecuting this work, however, we have been greatly assisted by the various Government Departments on both sides of





VIRGIN FALLS, OUTLET OF CROOKED LAKE, BOUNDARY WATERS,  
LAKE OF THE WOODS WATERSHED



DAM AT OUTLET OF SUCKER LAKE, WHICH DISCHARGES INTO BASSWOOD LAKE,  
BOUNDARY WATERS, LAKE OF THE WOODS WATERSHED



the boundary. We are now assembling our results. The mechanical work incident to the publication of the report, has been divided between the two Governments for execution at Washington, D.C., and at Ottawa.

**Nature of the Investigation** The questions relating to this Lake of the Woods investigation are set forth in an official Reference contained in a communication received, in June, 1912, by the International Joint Commission from the Governments of Canada and the United States. This communication states :

"I have the honour to inform you that at the joint request of the Government of the United States and of the Government of the Dominion of Canada, under the provisions of Article IX of the Treaty of January 11, 1909, between the United States and Great Britain, the questions of matters of difference set forth below which have arisen between them involving the rights, obligations, or interests of each in relation to the other, or to the inhabitants of the other, along their common frontier between the United States and the Dominion of Canada, are hereby referred to the International Joint Commission for examination and report upon the facts and circumstances of the particular questions and matters referred, together with such conclusions and recommendations as may be appropriate."

"The questions so referred are as follows :

"1. In order to secure the most advantageous use of the waters of the lake of the Woods and of the waters flowing into and from that lake on each side of the boundary for domestic and sanitary purposes, for navigation and transportation purposes, and for fishing purposes, and for power and irrigation purposes, and also in order to secure the most advantageous use of the shores and harbours of the lake and the waters flowing into and from the lake, is it practicable and desirable to maintain the surface of the lake during the different seasons of the year at a certain stated level ; and if so, at what level ?

"2. If a certain stated level is recommended in answer to question 1, and if such level is higher than the normal or natural level of the lake, to what extent, if at all, would the lake, when maintained at such level, overflow the lowlands upon its southern border, or elsewhere on its border, and what is the value of the lands which would be submerged ?

"3. In what way or manner, including the construction and operation of dams or other works at the outlets and inlets of the lake, or in the waters which are directly or indirectly tributary to the lake or otherwise, is it possible and advisable to regulate the volume, use, and outflow of the waters of the lake so as to maintain the level recommended in answer to question 1, and by what means or arrangement can the proper construction and operation of regulating works, or a system or method of regulation be best secured and maintained in order to secure the adequate protection and development of all the interests involved on both sides of the boundary,



with the least possible damage to all rights and interests, both public and private, which may be affected by maintaining the proposed level?"

Under this Reference the International Joint Commission authorized the consulting engineers to secure such data, and present it in such form, as would afford the Commission ample scope in its deliberations.

#### OTHER WATER PROBLEMS SUGGESTED

Questions connected with other waters such as with the St. John and the St. Croix rivers in New Brunswick ; navigation and power on the St. Lawrence ; transportation on the Great Lakes, and *via* the proposed Georgian Bay canal ; questions relating to diversion and power development on the St. Mary river, lake Superior ; or on the Fraser and the Columbia rivers in British Columbia ; diversions for irrigation, of the St. Mary and Milk rivers ; power or other problems involving the Pend d'Oreille. The Kootenay, Okanagan, Skagit and other rivers and lakes, may be mentioned as indicative of the many and diverse subjects related to water in which this Commission is interested, and frequently especially interested on account of the international complications which exist, or which may arise in connection with the use, or abuse, of such waters.

#### WATER-POWERS IN BRITISH COLUMBIA

In conclusion, I desire to refer to the large undertaking which we have had in hand for a period extending over about three years, namely, the proposed report on the water-powers of British Columbia.

When making the last annual statement on this work it was anticipated that the report might be issued in 1914. Consequently, a comprehensive *résumé* was then made, setting forth the general plan upon which the report was being prepared, and also specific reference was made to the various sources from which supplementary information was being secured. Such sources in British Columbia as, The Water Rights Branch, The Forest Branch, The Surveyor-General's Branch, The Electric Energy Inspection Branch, the various large power corporations, and others. Also from the Federal sources at Ottawa, such as, the Water-Power Branch, and the Department of Public Works. Reference was also made in the previous report to the valuable assistance received from the United States Geological Survey.

#### Collating Information

Information from these and some additional sources has been kept, so far as possible, up to date ; and hearty assurance has been given, wherever appeal has been made, that the co-operation formerly given to the Com-



TYPICAL STRETCH OF RAPIDS ON PEND D'OREILLE RIVER, B. C.  
This river, near its mouth, falls 400 feet in 16 miles.





mission, would be extended to bring information up to the end of 1914.

When we commenced our investigations in British Columbia, comparatively few data were available. There are certain characteristics governing the collating and arrangement of the information regarding this province which are exceptional. The season during which work can be prosecuted in the field is short, and, in any one season, it has been impossible to accumulate a great deal of information. Again, owing to a Water Rights Branch having been created at Victoria, with special administrative, legal and engineering officers, and other radical changes resulting from new legislation passed by the British Columbia Government, a considerable amount of our work, which produced results that would have been of special force and value, has been quickly superseded.

The Comptroller of Water Rights, Mr. William Young, is employing a portion of his staff, as opportunity offers, to assist us in making some of the necessary modifications. It will be seen, therefore, that in consequence of such characteristics as these, extra time has been required to deal satisfactorily with this subject.

**Publication of Report Delayed** Considering all the various features which have demanded attention, such as the Lake of the Woods investigation ; power development at Niagara, and like matters, and weighing one factor with another—not forgetting the need for caution which has arisen out of the European situation—it was decided that there was much to gain, and little to lose, by carrying the publication of the British Columbia report forward to 1915. A special effort has been made to advance this work, as the Commission is sensible of its obligation to the British Columbia Department of Lands, on account of the latter's liberal financial assistance in connection with the necessary field work.

As matters stand at present, it is believed that when our report is issued it will be of considerably more permanent reference value ; being, if one might use the expression, much better standardized, than would have been the case by earlier publication.

The work of the year has been heavy, and it will probably be months before certain matters, at present in hand, can finally be dealt with. Mr. C. J. Vick and Miss E. I. Gilby are still assisting with the office work, and I am pleased to have this opportunity of expressing my hearty appreciation of their assistance.

# Activities of the Committee on Water-Powers

BY

LEO G. DENIS

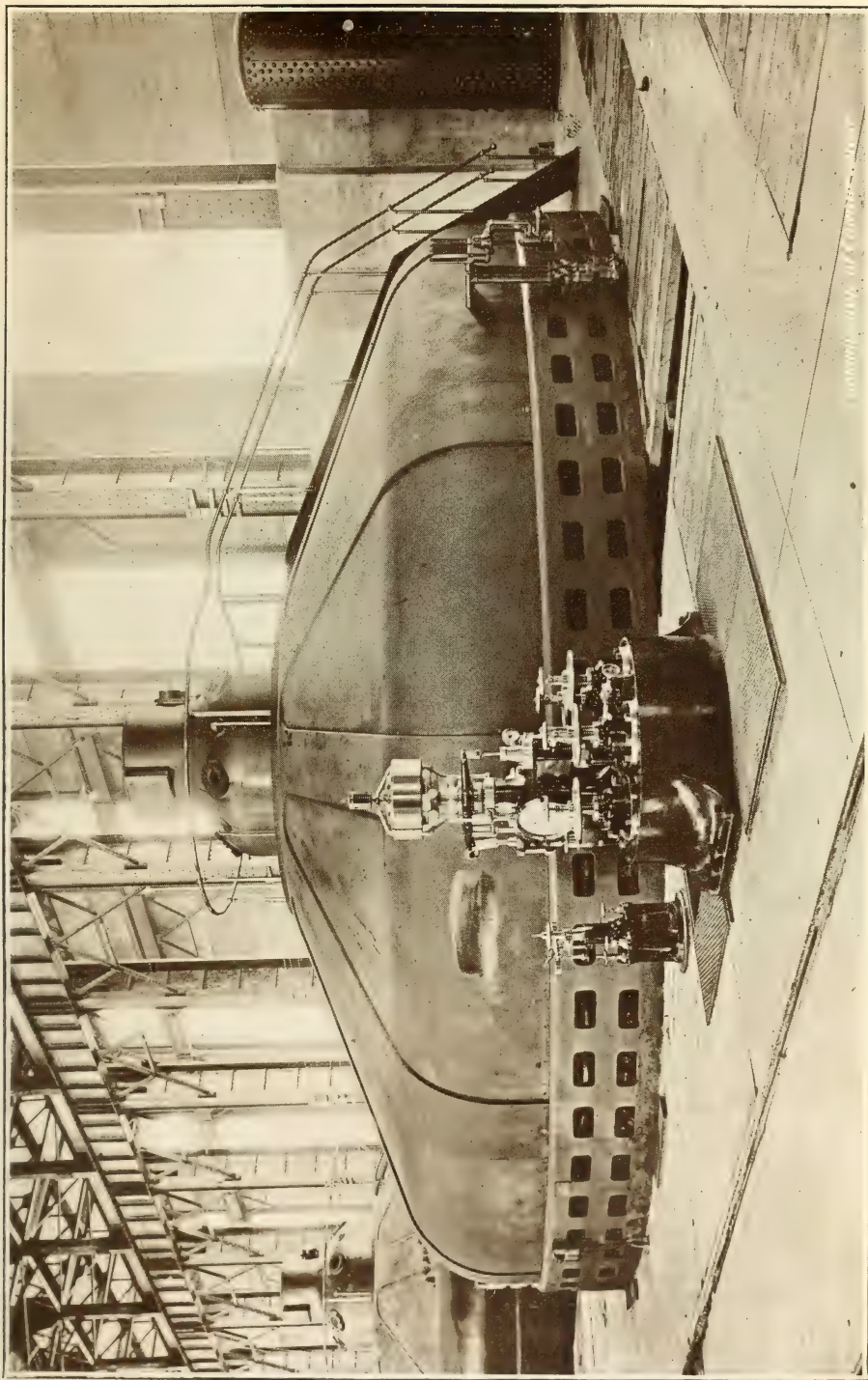
*Hydro-Electric Engineer, Commission of Conservation*

THERE was no field work undertaken during the past year in connection with the work of the Committee on Waters and Water-Powers. The office work consisted principally in the preparation and revision of two reports which are to be published shortly, one on the "Water-Powers of Manitoba, Saskatchewan and Alberta," the other on the "Water-Works and Sewerage Systems in Canada."

## Sources of Information

Our report on "Water-Powers of Canada," published in 1911, gave very limited information concerning the Prairie Provinces and the Territories, and the object of the first report referred to in the preceding paragraph is to give more complete and revised information for this portion of the Dominion. When the report, "Water-Powers of Canada," was compiled in 1911, the information on water-powers in the Prairie Provinces and Territories was very limited and practically confined to explorations by the Geological Survey and scattered information available through the courtesy of consulting engineers or private corporations. The reason for this lack of information may be attributed to many causes ; chief among which is the relatively recent development of this portion of Canada. Then, again, this development was more along agricultural than industrial lines, although water-power is useful to both ; and, lastly, the importance of water-power resources all over the world has only been appreciated since the advent of high-tension transmission of electric energy.

During the last three or four years, the different branches of the Dominion Government controlling the water-resources of the Prairie Provinces have been very active in investigation work. The Water-Power Branch of the Department of the Interior has conducted thorough water and water-power investigations in the southern portion, from the eastern boundary of Manitoba to the Rocky mountains. The Irrigation Branch of the same Department has, since 1908, established numerous stream-gauging stations on both large and small streams in the more settled portions of these provinces, and the continuous records kept for these are indispensable in determining estimates of flow or power.



CEDARS RAPIDS MANUFACTURING & POWER CO.  
One of the 10,000 h.p. units at the Cedar Rapids plant.





Thus, through the efforts of the two organizations just mentioned, it was possible to include in our forthcoming report very representative data for the southern or more settled portion of the Prairie Provinces. The remainder or more northerly portion was covered by reconnaissance surveys undertaken by your engineer and by compilation from various reports, chiefly those of the Geological Survey.

As is brought out in the report, the southern portion of the Prairie Provinces may be divided into three sections. Both the Rocky Mountain slope and eastern sections are fairly well provided with water-powers, and a few large ones have already been developed, giving important centres the benefit of hydro-electric power. The Bow river is the most important in the West, while the large water-powers of the Winnipeg river give it predominance in the eastern section.

The central section, lying between the two sections just referred to, possesses very few water-powers, in fact it almost lacks this natural resource, and the few existing possibilities are rather unfavourable. Considered as a whole, the southern portion of the Prairie Provinces has not been so generously endowed as the other provinces of the Dominion. Fortunately, the same cannot be said of the northern portion, and, according to the most reliable figures, as given in our report, the water-power possibilities in this portion on the Athabaska, Peace, Slave, Churchill, Nelson, and other rivers are very great. The only unfortunate feature is that these rivers, and their splendid possibilities, are situated so far to the north and distant from the settled portions of the provinces. But even where they are, it will only be a relatively short time before they are utilized.

**Water-Works and Sewerage Systems in Canada** The other report upon which attention was directed, "Water-Works and Sewerage Systems in Canada," is a revised edition of the report published in 1912. Besides correcting and bringing up to date the information in the first edition, it also contains numerous additions. Among the latter may be mentioned short descriptions of sewerage systems under each municipality and additional municipalities where water-works have recently been installed.

It may not be out of place to note here the advances made in Canada along some of the lines which are of particular interest to the Committee on Water-Powers.

**Stream-flow Data** During these last few years a remarkable advance has taken place in Canada in obtaining information respecting the flow of streams. There are now in operation, under the supervision of the different Branches of both Federal

and Provincial Governments, 635 stream-gauging stations, most of which have been established within the last two years. These stations are operated by six or seven different organizations, and, as many others are being operated by private parties, it is desirable that all these stream-flow data be collected and published in a uniform manner for all the rivers of the Dominion.

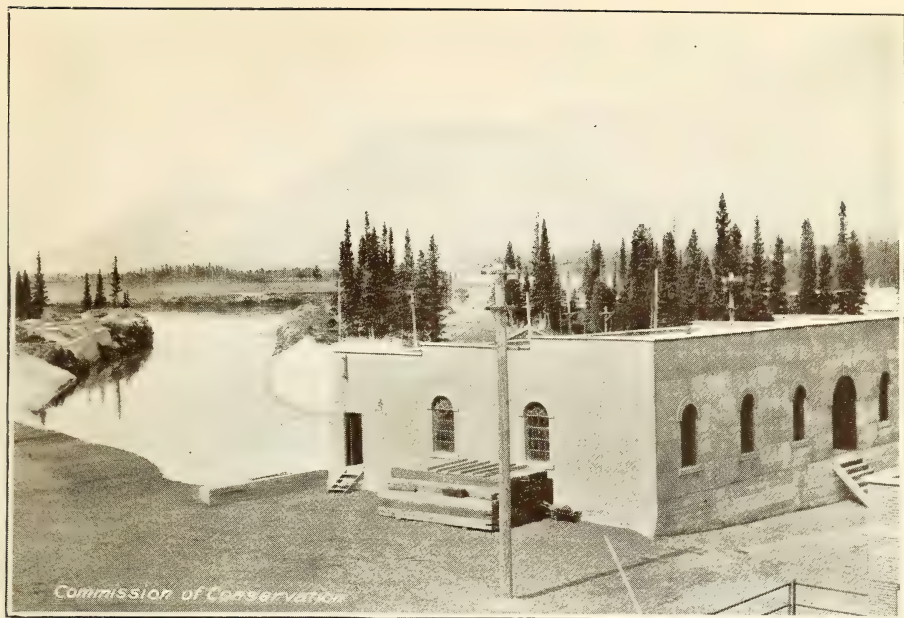
**Conservation  
of Water**

Of late, Canada has been particularly active in water-power and kindred development. Thousands of horse-power are continually being added, either in new developments, as the 100,000 h.p. plant at Cedar rapid, near Montreal, or as additions to already existing plants. As a consequence of this rapid progress, attention is being turned more and more to water conservation or storage projects. In almost every province one or more of these projects are either under consideration or actually being proceeded with.

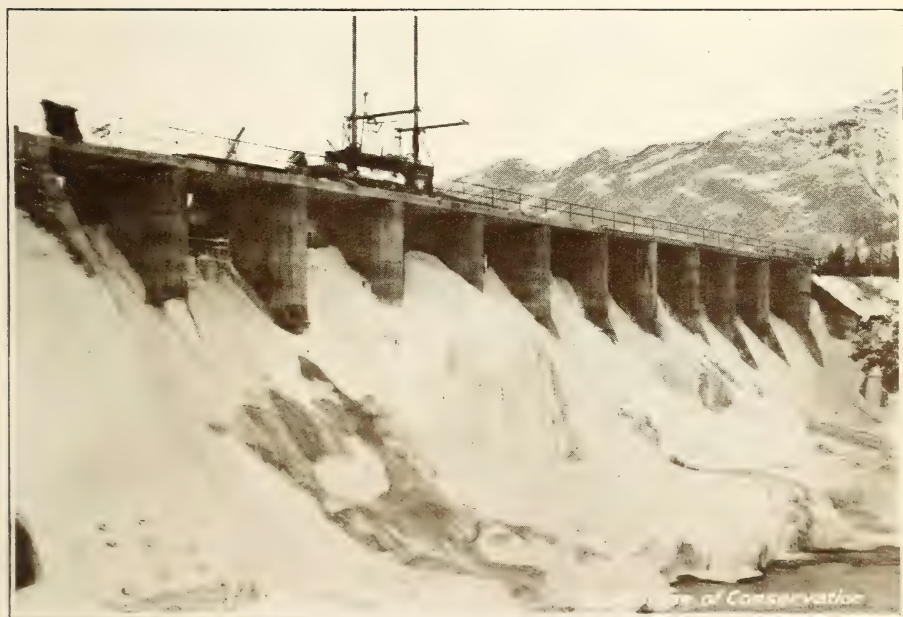
In this connection, it may be of interest to mention one point which is of particular interest to Canada. Many investigations have been undertaken and much has been written both here and in other countries on the subject of water storage, but, thus far, little has been said on the best manner of conveying the stored water to the point where it is to be used. In countries where winter conditions are not severe the problem offers no difficulties, but in the greater part of Canada, for instance, north of the St. Lawrence and Ottawa rivers and of same latitude farther west, lowest water in the streams occurs in winter and the stored water will have to be conveyed when the average temperature is very low. Where the storage basin is not far distant from the point at which the water is to be used, little difficulty may be expected, but, if the stored water has to travel any great distance, the greater portion of it may freeze on the way and become unavailable. It should be possible to avoid this to a certain extent by being guided by certain principles in releasing the stored water. In this connection, the following extract from a letter received some time ago is of interest. It refers to a well-known hydro-electric plant in Canada :

"Our operating conditions were such that it was necessary to conserve as much storage as possible for the months of March and April. Therefore, water was used only during cold weather when river flow was very low during the early part of the winter. This method caused considerable trouble with ice and reduced the efficiency as nearly as could be figured to about 50 per cent and, in one or two instances, practically doubled the time which should have been taken by the water in reaching the plant from the storage.





CANAL AND GATE HOUSE, KANANASKIS PLANT, CALGARY POWER CO.  
KANANASKIS, ALBERTA



KANANASKIS DAM DURING WINTER, SHOWING MOTOR-DRIVEN STOP-LOG WINCH,  
CALGARY POWER CO., KANANASKIS, ALBERTA.



This was caused by the river channel being reduced by freezing, and the extra water allowed to flow ran out on top of the ice and immediately froze."

It might be advisable for the interested Branches of the different Governments to take up this question and investigate it either by carrying out experiments or at least by gathering all possible information from the different power plants which have had to cope with this difficulty.

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The Commission adjourned, to meet on Wednesday, January 20, at 10 o'clock in the morning.

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## Commission of Conservation Press Service

BY

JOHN DIXON

*Editor, Commission of Conservation*

THE publicity work of the Commission for the past year, under the direction of the Committee on Press and Co-operating Organizations, has been somewhat enlarged and extended. Greater effort has been made to secure through the newspapers of Canada the increased enlightenment of the general public as to the benefits, both direct and indirect, of conservation of natural as well as of created resources. To get closer in touch with newspaper men our editor attended the annual meeting of the Canadian Press Association in Toronto in July last, and, to a large number of editors, individually as well as from the platform, explained the work of the Commission of Conservation and its aims. There appeared to be a great variation of ideas among newspaper men as to the objects of the Commission. Our editor was able by personal contact to remove many wrong impressions, and it has been observed that a large amount of space is being given by the newspapers to conservation work.

*Conservation*, the Commission's monthly bulletin, has been continued, the copies especially prepared for the newspapers being printed on one side only for their convenience. During the past year, considerable attention has been paid to the large annual fire loss, as well as to the "safety first" movement. Reduction in fire losses appears to be coming slowly as a result of the efforts made by many agencies.

The loaning of cuts appearing in *Conservation* has been continued, and there is an increasing demand for their use.

A new publication *Conservation of Life*, was issued in August and October. This publication was initiated to supply information on the subjects of public health and town-planning. Its circulation covers the health officers, municipal officers, and officers of the Local Councils of Women, as well as the newspapers. As our Medical Health Adviser, Dr. C. A. Hodgetts, was appointed Red Cross Commissioner in Great Britain, it has been discontinued during the war.

Special bulletins have been issued, to newspapers only, during the past five months, and these have been given extensive publicity.

In addition to the above, reports have been issued on the "Trent Watershed Survey," "Conservation of Coal," "Fur Farming in

Canada" (second edition), and the proceedings of the Fifth Annual Meeting. Details of these publications are as follows :

PUBLICATION	No. Pages	No. Copies	Total Cost	Cost Per Volume
Trent Watershed Survey.....	164	12000	\$7312.16	\$.609
Conservation of Coal.....	223	12000	6320.78	.527
Fur Farming (Second Edition).....	306	6000	3344.51	.557
Fifth Annual Report.....	295	11000	5519.15	.502
Six Separates from Annual Report :				
Chairman's Address.....	18	300	6.96	.....
Protection of Migratory Birds. .	8	300	4.44	.....
National Council of Women and				
Conservation.....	6	300	4.44	.....
Agricultural Survey.....	40	1500	59.30	.....
Uniform Laws for Plumbing....	12	300	4.56	.....
Importance of Bore-hole Re-				
cords.....	16	500	20.00	.....

*Conservation*, 12 monthly issues, total circulation 77,600 copies, at a cost of \$1,125.89.

*Conservation of Life*, two issues, total circulation 20,000 copies, at a cost of \$394.23.

There is in press a report on "Water-Powers of Manitoba, Saskatchewan, and Alberta," by Leo G. Denis and J. B. Challies.

There is also in preparation a report covering a "Power Survey of Canada," by W. J. Dick ; a revised edition of "Waterworks of Canada," by Leo G. Denis, and "Forest Protection in Canada, 1913-14," by Clyde Leavitt.

The members of the editorial staff have also supplied many special articles to the trade papers and magazines.

The reports and publications of the Commission are meeting with increased demand, and care has to be exercised in their distribution. The lists are kept carefully revised, to avoid waste.

Numerous addresses on conservation have been given by members of the Commission and by the advisers. As president of the Royal Society of Canada, Dr. Adams, Chairman of the Committee on Minerals, chose as the subject of his presidential address, "The National Domain in Canada and its Proper Conservation." This address is being reprinted in pamphlet form. Our agriculturists have conducted meetings in various parts of the country, and great interest has been taken in their work. A number of conventions have been attended by the staff of the Commission, and conservation subjects have been kept before the public.

# Housing and Town Planning in Canada

BY

THOMAS ADAMS

*Town Planning Adviser, Commission of Conservation*

**M**R. CHAIRMAN, ladies and gentlemen : The subject of town planning is a very wide one and Canada is a very large country, so that I am afraid I shall have to take up a considerable portion of your time this morning in dealing with this matter, especially as we have just extended the work of the Commission in connection with housing and town planning. The question has been dealt with at previous annual meetings by Dr. Chas. A. Hodgetts, Medical Adviser to the Commission, in connection with public health work. Dr. Hodgetts, as you know, is absent in Europe and I shall have to try to cover in the report which I have to present to you the report of the work during the whole of the past year, as well as to indicate as far as I can the work we contemplate doing in the future.

## Summary of Work Already Done

In the first place it seems appropriate to review and summarize the references to town planning and housing which were made at previous annual meetings of the Commission.

The matter seems to have been considered for the first time in the paper on "Unsanitary Housing," submitted by Dr. Hodgetts, in 1911. He drew attention to the existence of slum conditions in Quebec, Ontario, and Manitoba, to difficulties in housing the foreign immigrant population, and to the inadequacy of health laws. Town planning was advocated on the lines of Part II of the British Housing and Town Planning Act of 1909.

In the report of Dr. Hodgetts, submitted in January, 1912, the need for housing legislation was referred to, and attention was drawn to errors in Canadian town planning, or rather to the absence of town planning.

Dr. Hodgetts summarized the town planning and housing activities in Canada up to 1912, as follows :

Passing of Winnipeg Tenement House by-law in 1909.

Appointment of the first Winnipeg Town Planning Commission.

Passing of the Housing by-law in Toronto.



Work of Toronto Civic Guild and Montreal Civic Improvement League.

Appointment of Parks Commission of Montreal.

Planning of Prince Rupert and Port Mann.

Work of Ottawa Improvement Commission.

In 1913, progress was reported in many of the provinces of Canada. Ontario, Manitoba, and Alberta had revised their Public Health Acts. Town Planning Acts, based on the British Act, had been passed by the Provincial Legislatures of Nova Scotia and New Brunswick. The "City and Suburbs Plans Act" was passed by the Ontario Government for cities over 50,000 in population.

Nova Scotia and Saskatchewan had passed Acts to regulate the erection of tenement houses.

Housing and Town Planning Conferences had been held at Winnipeg and Berlin (Ontario), at which committees were formed, having for their object the formation of a Canadian "Housing and Town Planning Association." It was also advocated that the Commission should call a national congress to discuss the subject.

At the meeting in 1914, Mr. G. Frank Beer read a paper pleading for a City Planning Organization. He drew attention to the desirability of emphasizing the economic rather than the æsthetic side of town planning, and suggested that the Commission should call a Housing and Town Planning Conference each year. He also referred in another paper to the work of the Toronto Housing Company.

The late Lieut.-Col. Jeffrey H. Burland reported on the work done by the committee on town planning legislation. On behalf of the committee he reported that the public were in need of education on the subject, and that the Commission should take steps to make known the practical and economic importance of modern town planning. He referred to the need for a "Department of Municipal Affairs" in each province, under which there should be a Town Planning and Housing Board.

The report of the 1914 meeting contains records of the passing of the following Acts\*:

Quebec—Act to Assist in the Construction of Dwelling Houses in Cities, Towns and Villages.

Ontario—Act to Encourage Housing Accommodation in Cities and Towns.

Alberta—Act Relating to Town Planning.

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\*See Appendices, *Fifth Annual Report*, Commission of Conservation.

Dr. Hodgetts reported on town planning conferences as follows : National Town Planning Conference, Chicago, May, 1913 ; Massachusetts Town Planning Conference, Boston, November, 1913. He also referred to the International Conference on Town Planning at Toronto in May, 1914, which was then being planned, and to the desirability of forming a Canadian Town Planning and Housing Association.

**Growing Interest  
in Town Planning**

The above outline indicates the growing interest in town planning and housing throughout the Dominion and the tendency of public opinion in a direction favourable to effective town planning legislation. There has not been much practical accomplishment, but that could hardly be expected in so short a time, and without adequate legislation.

The most advanced town planning legislation has been passed by the legislatures of Nova Scotia, New Brunswick, and Alberta, and in a secondary sense by Ontario. The character and scope of the Acts of these provinces will be alluded to later. In regard to housing, the legislation of Quebec and Ontario shows most advance and the practical outcome of the latter has been to enable the Toronto Housing Company to carry out useful and admirable housing experiments. The work of Mr. G. Frank Beer in that connection has been very valuable and likely to be of great public service in the future. There is great need for the application of the Provincial Act in Montreal and Quebec, and of the Ontario Act in Ottawa and Hamilton, but no action has been taken up to the present.

**Progress  
During 1914**

I now come to the work of the Commission in connection with town planning and housing during the past year. Between January and May, 1914, the Committee on Town Planning Legislation completed the preparation of the first Draft Town Planning Act. A great deal of thought and time was given to the draft and the Commission owed a debt of gratitude to the late Lieut.-Col. Jeffrey H. Burland for his services in the matter. The draft was completed in time for the International Town Planning Conference, which was held in Toronto in May last. It was submitted to the conference for discussion, and appeared to meet with approval as regards general principles. It was suggested, however, by delegates from the West that their conditions differed from those in the East, and required different treatment, and also that municipalities should have larger powers of jurisdiction under the proposed Act.

Since May, 1914, the matter has been further considered and a revised draft has been prepared, after consultation with Mr. F. H. Gisborne, parliamentary counsel.





DRIVEWAY IN BALTIMORE, MD.  
Showing method of cutting roads through woods and the efforts to preserve trees.





## INTERNATIONAL CONFERENCE AT TORONTO

The Conference held at Toronto in May last was attended by a large number of delegates from Canada and the United States and a few representatives from England. The Commission of Conservation was the host. It was opened by H.R.H. the Duke of Connaught. The address delivered on that occasion by His Royal Highness, and the address of welcome, are printed as an appendix to this report.\* Papers were submitted as follows :

1. Basic Principles of Waterfront Development as Illustrated by the Plans of the Toronto Harbour Commissioners, by Robert S. Gourlay.
2. Certain Aspects of Municipal Financing and City Planning, by Andrew Wright Crawford.
3. Progress of the Year in City Planning, by Flavel Shurtleff.
4. Protecting Residential Districts, by Lawrence Veiller and others.
5. A Canadian Town Planning Act : Consideration of Principles and Procedure, by Lieut.-Col. Jeffrey H. Burland and Dr. Hodgetts.
6. Canada as a Field for the Garden City Movement, by G. Trafford Hewitt.
7. Provision for Rapid Transit : Subway, Elevated or Open Cut, and their Influence on the City Plan, by J. V. Davies, John A. McCollum and the Hon. George McAneny.
8. Rapid Transit and the Auto Bus.
9. The Size and Distribution of Playgrounds and Similar Recreation Facilities in American Cities, by Professor H. V. Hubbard.

Addresses were also delivered by the Hon. George McAneny, Acting Mayor of New York, and by Frederick Law Olmsted, and I took part in the discussion on the draft Town Planning Act.

The conference closed with a banquet, presided over by the Chairman of the Commission of Conservation, at which the following speakers gave addresses : Hon. Martin Burrell, Minister of Agriculture ; Hon. W. J. Hanna, K.C., Ontario ; Hon. George McAneny, New York ; Hon. George Langley, Saskatchewan ; Mr. J. L. McCarthy, Toronto, and myself.

The conference resulted in drawing a large amount of public attention to the subject of town planning, and in arousing interest in it on the part of many public men in Canada. Both in regard to the number of delegates and the practical nature of the discussions the conference was one of the most successful so far held on this continent.

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\* See Appendix I.

**Town Planning  
Exhibition**

In connection with the conference a town planning and housing exhibition was held in the Convocation Hall of Toronto University. Plans, drawings and diagrams were collected from many Canadian cities, a number of cities in the United States and from other countries, including Great Britain and Germany. The exhibition gave a striking illustration of the activities of cities in Canada, and some of the plans exhibited, including those from Calgary, Toronto and Winnipeg, showed that bodies of citizens in these growing centres had incurred considerable expenditure in preparing schemes for their future development. The exhibition was opened by H.R.H. the Duke of Connaught, and during the conference week it attracted large numbers of citizens.

**Town Planning  
Adviser**

In July last it was decided to take steps to create a Town Planning Branch of the Commission and to appoint a town planning adviser. My appointment to that position was made about the end of July, and I took up my duties in October. To some extent the great conflict in Europe, in which Canada is so deeply interested and involved, is unfortunately interfering with the opportunities which were formerly open to promote town planning and housing reform in the Dominion. But it is nevertheless desirable that the work already begun by the Commission in giving publicity to town planning, in investigating housing and municipal conditions and in promoting legislation to deal with both matters, should not be suspended even during this critical and difficult time. The absence in Europe of Dr. Hodgetts is regrettable from the point of view of the extension of the work, but every effort is being made to secure that the public health activities of the Commission will suffer as little as possible from the temporary loss of the services of its medical adviser.

**Present an  
Opportune Time**

There are strong grounds, however, on which it may be claimed that this is an appropriate time to carry out the preparatory work in connection with town planning and housing reform. The incoming stream of immigration has practically ceased to flow, thereby temporarily suspending urban expansion ; we are face to face with a period of slump in real estate, and are free from the injurious effects of gambling in fictitious land values which characterizes periods of boom ; and we have presented to us in an unusual degree the evils of haphazard development of land and bad housing conditions, which show at their worst during periods of slackened employment. If only sufficient attention can be diverted to the subject on the part of public men, no time could be more appropriate for getting to work.



In England there appears to be no slackening in connection with the application of the Act of 1909. In October, 1914, no less than 137 local authorities in Greater London considered the desirability of proceeding with the work of preparing a scheme for main arterial roads for 1,000 square miles of area, and the decision of these representatives was that the work should be continued. The Local Government Board of England has also strengthened its town planning staff since the war began. In connection with housing, one of the first measures passed by Parliament in Great Britain after the beginning of the war was an act to make available a sum of \$20,000,000 for housing purposes.

**Scope of  
Commission's  
Efforts**

The work of the Commission in connection with town planning and housing may be summarized as follows :

1. Consideration and investigation of the twin subjects of town planning and housing as a special Canadian problem, regard being had to the experience of other countries.
2. Consideration of the questions of remedying and altering existing bad conditions in towns and cities and the best methods of avoiding the repetition of these conditions in the future. Both remedial and preventive measures have to be devised and incorporated in draft legislation. These measures have to be considered concurrently, but different courses of treatment have to be designed for each.
3. Further consideration of the draft Town Planning Act, in conference with provincial and municipal authorities, especially in regard to the kind of provincial and municipal machinery required for its administration.
4. Preparation of a new Housing Act as a model for provincial legislatures after further investigation into housing conditions.
5. In connection with the above matters visits will require to be made to the different provinces and many of the cities in the Dominion to discuss points which have to be considered in regard to their local or provincial application. Incidentally, these visits will be used as an opportunity for giving advice to municipalities with regard to local schemes and with regard to work which they can do without waiting for legislation.
6. Advice will be given to municipalities and owners of land with respect to town planning and housing, and in that connection a collection is being made of literature, maps, photographs and slides so that these could be placed at the disposal of those able to make use of them.

## TOWN PLANNING LEGISLATION IN CANADA

The present position in the various provinces in regard to town planning and housing legislation is as follows :

**Nova Scotia** A Town Planning Act was passed on May 3, 1912.\* This Act was framed on the basis of Part II of the British Act of 1909, but differs from the latter in important respects. It gives any city, town or municipality the right to prepare a scheme without application to a central authority, except that where land in the area of one local authority is included in the scheme of another local authority the scheme will not come into force unless it has been approved by the Governor in Council. The procedure regulations are also to be prepared by the city, town or municipality and not by a provincial authority. Clause 14 is a housing clause and provides that the council may cause a company to be formed for the erection of houses and may guarantee the bonds of the said company up to one-half of the capital required for the enterprise. It may similarly guarantee the bonds of any company applying for authority to prepare a town planning scheme which shall include the erection of houses. Steps are being taken in Nova Scotia to amend the Act, and I have concluded arrangements to visit Halifax and confer with the Government on this subject during the coming month.

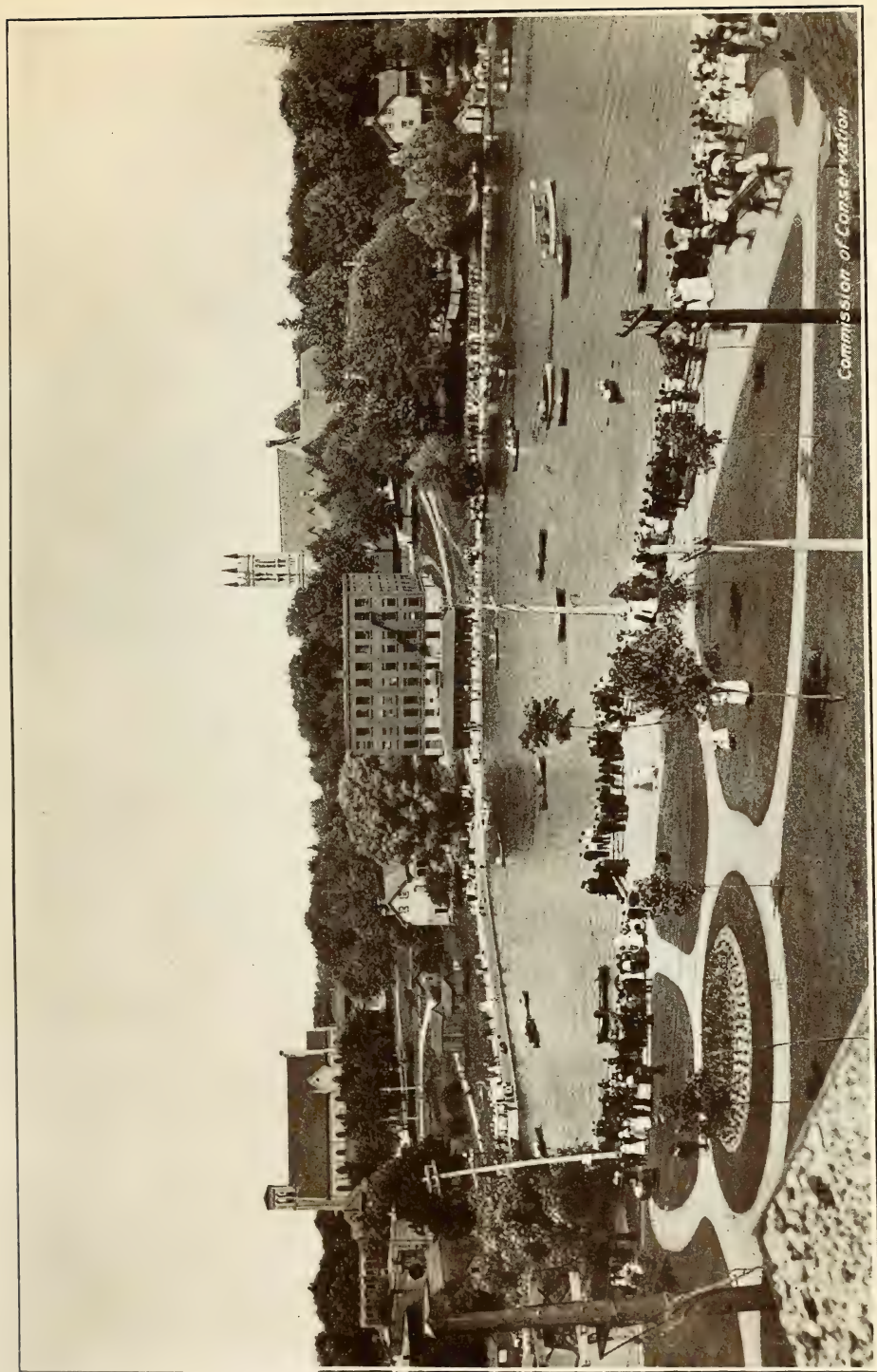
*Halifax City Charter* : This charter contains sections relating to an official city plan and provides *inter alia* for the preparation of a plan of the city showing the lines of existing and projected streets, and public notice of the completion of the plan has to be given. After confirmation it shall be binding, and no person shall open or lay out any street or make any extension of an existing street, not shown on the plan, without the consent of the council.

Up to the present no action appears to have been taken in Nova Scotia, but the powers given under the provincial Act and the Halifax city charter together form the most advanced legislation in the Dominion.

**New Brunswick** A Town Planning Act was passed April 20, 1912.† This Act conforms more strictly to the British precedent than the Nova Scotia Act. The Government, or, in other words, the Lieutenant-Governor in Council of the Province, takes the place of the Local Government Board in the British Act. Clause 5 is new and provides that the manner of

\*Quoted in full in the *Fourth Annual Report* of the Commission of Conservation, page 206.

†Quoted in full in the *Fourth Annual Report* of the Commission of Conservation, page 210.



BEAUTY SPOT IN STRATFORD, ONT.  
Made from a frog pond and a dump ground through the enterprise of the Stratford Parks Commission.





obtaining the funds necessary for carrying the scheme into effect must be defined. The responsible authority preparing the scheme must obtain the consent of each local authority in control of the area affected, before it can make any assessment upon any city, town, parish or county, or before it can borrow money. No action appears to have been taken in New Brunswick under the above Act up to the present time.

*Town Planning* : There is no Town Planning Act in Quebec.

*Housing* : An Act has been passed to assist in the construction of dwelling-houses in cities, towns and villages.\* This Act provides that the council of any municipality may guarantee the loans of a company formed for the purpose of erecting dwelling-houses. It must be proved that additional houses are required and the dividend declared on the capital stock must not exceed six per cent. The by-law respecting the loan must be approved by the municipal electors having a right to vote on money by-laws, except in Quebec or Montreal in which a by-law is only required to be approved by a two-thirds vote of the council or Board of Commissioners. The amount of the loan which may be guaranteed shall not exceed 85 per cent of the value of lands or houses. No action has yet been taken to use the powers conferred by this Act. There are several cities in Quebec province, including those of Montreal and Quebec, where it appears desirable that additional housing accommodation should be provided for the working classes under this Act. Housing companies should be formed in these cities to put the Act into operation.

*Town Planning* : No Town Planning Act has been passed, but certain powers are given to the Municipal and Railway Board under *The City and Suburbs Plan Act*,† Chap. 43, 2 Geo. V, to supervise the subdivision of land within five miles of a city having a population of not less than 50,000 inhabitants. The Act is of comparatively small value in securing the proper planning of even the few cities to which it applies.

*Housing* : The *Act to Encourage Housing Accommodation in Cities and Towns* was assented to on May 6, 1913.‡

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\* Quoted in full in the *Fifth Annual Report* of the Commission of Conservation, page 239.

† Quoted in full in the *Fourth Annual Report* of the Commission of Conservation, page 220.

‡ Quoted in full in the *Fifth Annual Report* of the Commission of Conservation, page 245.

The Act corresponds to and was passed prior to that of the Quebec Legislature, which I have just described.

The Toronto Housing Company has been formed to operate under this Act, and has successfully carried through two important housing schemes, regarding which a full report\* was submitted by Mr. G. Frank Beer at the fifth annual meeting of the Commission. The value of the company's work will be as much in providing an object lesson in house-building as in providing houses where they are much needed. There is pressing need for additional housing accommodation at rents within the reach of the working classes of Ottawa and it is desirable that a Housing Company should be formed in the capital city to operate under this Act.

<b>Manitoba</b>	No Act has been passed in Manitoba, but a draft
<b>Saskatchewan</b>	Act has been prepared to be submitted to the Pro-
<b>Alberta</b>	vincial Parliament in February, 1915, by the Greater

Winnipeg Town Planning Commission.

There is no Town Planning Act in existence in Saskatchewan, but power is vested in the Highway Board to control subdivisions.

A Town Planning Act was passed in Alberta on March 25, 1913.† This Act generally conforms to the New Brunswick Act, but the Minister of Municipal Affairs has been given powers similar to those vested in the Lieutenant-Governor in Council under the New Brunswick legislation.

<b>British Columbia</b>	No Town Planning Act has been enacted, but the
	inspector of municipalities, recently appointed under
	the Municipal Department of the province, has

certain powers of supervision which, however, do not extend to approving subdivisions of land. Certain powers of approving surveys of building lots are given to the city engineers and mayors of municipalities, but these can hardly be regarded as exceeding ordinary by-law powers in other provinces.

#### ACTION TAKEN BY CANADIAN MUNICIPALITIES

In addition to the above legislative powers gradually being obtained in the different provinces, independent action has been taken in several cities.

*Montreal* : In Montreal, as previously reported by Dr. Hodgetts, there has been a City Improvement League in existence for some

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\* See the *Fifth Annual Report* of the Commission of Conservation, page 116.

† Quoted in full in the *Fifth Annual Report* of the Commission of Conservation, page 249.



time, and efforts have been made to secure a plan for the city and the island. Chiefly as a result of its efforts, the Quebec Legislature, in 1910, appointed a Commission to enquire into the need for such a plan and the Commission recommended the appointment of a Metropolitan Park Commission to prepare and to execute plans for a greater Montreal. Later, a joint Social Survey Commission was formed to compile statistics and survey of the needs and conditions of Montreal. Up to the present, however, no definite result has been obtained in connection with these movements.

It is desirable that the powers and name of the Park Commission should be revised so as to make it a Town Planning Commission for the purpose of considering the whole question of preparing a comprehensive scheme for Greater Montreal.

*Ottawa :* A Town Planning Commission was appointed by the Federal Government in 1913 to prepare a plan for "a greater Ottawa." The report of this Commission is about to be submitted to Parliament. The Ottawa Improvement Commission continues its work of improving the park system of Ottawa.

*Winnipeg :* The Greater Winnipeg Town Planning Commission was created by the Board of Control of Winnipeg early in 1914 and takes the place of a previous commission appointed in 1911. It is preparing a plan for an area comprising 200 square miles, and is interesting itself in proposals for town planning legislation. I am in correspondence with Prof. Stoughton, the professional adviser of the Commission, with regard to the form of the proposed act.

*Selkirk :* The Board of Trade of the town of Selkirk (3,500 inhabitants) has had a scheme prepared. It appears to be limited in application to the developed area of the town. It has been approved by the municipal council and the Canadian Pacific railway, and an endeavour is being made to secure funds to purchase some of the lands required to carry it out.

*Edmonton, Calgary, Berlin and Brantford :* Plans have been prepared for these cities and their environs, but no definite steps have been taken to give them practical effect. The report prepared for the Calgary City Planning Commission was only submitted in April, 1914. The report is well produced and the Commission seems to have spared no expense or effort in investigating their local conditions and in having a scheme prepared for the future development of the city. The Brantford report has just been completed.

*Banff :* The Dominion Parks Branch has obtained plans for the lay-out of Banff, and has consulted me with regard to the plans and

methods of carrying them out. For this purpose I have paid a short visit to Banff, and have arranged to pay an extended visit in the late spring with a view to making some recommendations to the Parks Commissioner.

*Vancouver* : The Civic Centre Committee of Vancouver recently promoted a competition for designs for a civic centre. I acted as assessor and made my award after a visit to Vancouver in December. I have also submitted a report on the planning of "greater Vancouver" to the Committee and have recommended that steps should be taken to prepare a topographical map of the large area included in the municipalities of Vancouver, Point Grey, New Westminster, and North and South Vancouver. The report is printed in the January issue of *Conservation of Life*. See Illustration facing page 168.

*Toronto* : A Toronto-Hamilton Highway Commission has been appointed by the Ontario Legislature to carry out a scheme for constructing a new road from Toronto to Hamilton. The Commission has appointed Mr. W. A. McLean, Provincial Highway Commissioner, Prof. Laing of Toronto University, and myself as an Advisory Committee. I have attended three conferences at Toronto with regard to this matter. There could be no better way to utilize labour which is temporarily unemployed than in carrying out improvements of this kind, especially when these improvements are part of a well-defined scheme. See Illustration facing page 158.

**Educational  
Work  
Undertaken**

In addition to several private conferences which have been attended, meetings have been addressed as follows during the past two months :

Toronto, Ontario—Meeting of Toronto Housing Company.  
Berlin, Ontario—Public meeting.

Washington, U.S.A.—Three addresses at conferences of American Civic Association, and American Institute of Architects, one at meeting of Federation of Women's Clubs, and one at public meeting.

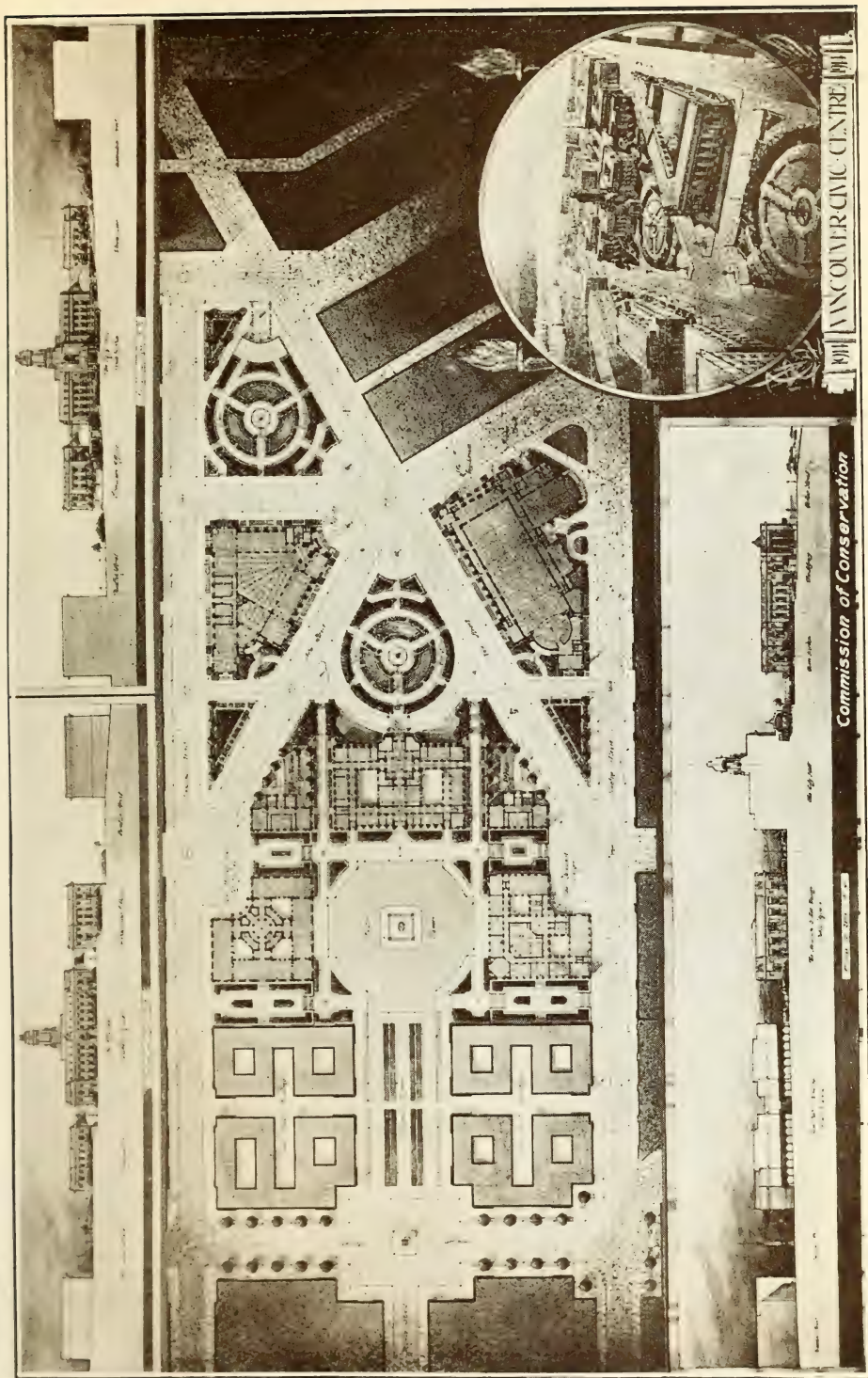
Vancouver, B.C.—One address to Canadian Club and two under auspices of Civic Centre Committee.

Victoria, B.C.—Address at public meeting.

Montreal, Quebec—Address at Canadian Club.

In these addresses it has been necessary to emphasize the fact that town planning is concerned with all matters connected with the life and growth of a city and that the main object of the town plan should be to promote sound and healthy conditions in connection with its business life and the housing of its citizens.





PLAN OF CIVIC CENTRE IN VANCOUVER, B. C.

The plan was submitted by Theodor Korner and Robert H. Mattocks, and was awarded first prize by the Assessor, Mr. Thomas Adams, Commission of Conservation. It shows proposed sites for City Hall, Auditorium, Library, Museum and Art Gallery, and Technical College.





It is desirable to continue and to extend educational work by means of public lectures and addresses, but it will be necessary to avoid taking up too much time in that direction, in view of the great need there is for giving practical help and technical advice to those in authority in civic affairs. In a sense the latter is the more important duty, although it needs the assistance of the former to make it effective. The education of the public should be carried out by practical demonstrations of town planning as well as by theoretical teaching, and with that end in view it is desirable to get as many local authorities and town planning commissions as possible at work, on the right lines, without any unnecessary delay, and to push forward the legislative proposals of the Commission. A great deal of publicity work could be arranged to be done through local lecturers, and I think we might, with advantage, set up some organization for that purpose in the near future.

Material has been prepared for a special town planning and housing issue of *Conservation of Life*, published this month, and several articles have been written for other publications with the object of educating the public with regard to the right view of town planning.

**Collection of  
Maps and  
Reports**

The following recommendation was submitted at the last annual meeting of the Commission by the Committee on Public Health :

“That this Commission, having in view the large amount of technical information required for the use of those interested in questions of housing and town planning, and believing that the same should be properly collected and made easily obtainable everywhere in Canada, arrange at once for the elaboration of the information now on hand and provide for its extension along the most practical lines.”

In pursuance of this resolution, which was adopted at the meeting, we have been continuing to add to the collection begun by Dr. Hodgetts. Since October last a large number of topographical and other maps and about fifty city planning reports have been collected.

**Advice to  
Municipalities**

With regard to the work which should be taken in hand during the current year, consideration has to be given to the difficulties created by the war, and to the financial stringency which exists in the Dominion in connection with municipal affairs. As already stated, this is a good time to prosecute the work of investigation which should precede town planning and housing legislation, all the more so because of the inactivity in building operations. In the course of carrying on

that work, numerous opportunities will arise for giving advice to municipalities and for educating public opinion by means of work which can be done in this direction alone, and the chief consideration will be to do that which is most useful. Municipalities have to be persuaded that proper town planning will result in true economy, and it is part of the work of the Commission to give guidance and information on this point.

**Exhibitions of  
Plans, Etc.**

The work of education will be greatly facilitated and assisted when the Commission has completed its collection of maps, plans, diagrams, etc. A series of diagrams should be prepared, illustrating Canadian conditions. When complete the collection might be permanently housed in Ottawa with such local plans and maps as can be brought together. Arrangements could then be made to lend the collection to the various cities and towns in Canada, and the main collection could be supplemented in each place by local maps, prints and diagrams. I have reason to believe that such an exhibit would be welcomed by the councils of several cities and towns and that they would give space for hanging the collection in the city halls.

**National  
Conference**

Among the proposals which were agreed to at the fifth annual meeting of this Commission was one relating to the organizing of an annual Town Planning and Housing Conference under the auspices of the Commission. The question of whether such a conference should be held in Ottawa during the present year is under consideration.

The revised draft of the Town Planning Act is now complete and is being submitted to the provincial legislatures in its approved form. Conferences are being arranged in the different provinces to discuss such amendments or alterations as may be necessary to make the draft conform to local conditions and legal requirements.

**Housing  
Conditions and  
Legislation**

In connection with housing, the investigation and study of housing conditions in the Dominion is a matter requiring urgent attention. We need to prepare a draft Housing Act, but before its final form can be settled much information will be required regarding existing conditions. Consideration is being given to the desirability of promoting a housing survey in the largest cities and towns. Such a survey would only be successful in securing adequate information if it included investigation into the methods of subdividing and promoting the sale of real estate, and also into the method of valuing land for purpose of assessment. We have before us the British precedent



for such an investigation, where the difficulties and cost of making it were much greater than they would be in Canada, and where, in order to arrive at the right conclusions regarding town planning and housing reforms, enquiry had to be made into questions of land tenure, rating and valuation, as well as that of suburban transit. The British investigation was completed last year by a special Committee appointed by the Chancellor of the Exchequer. The schedule prepared by that committee as the basis for enquiry could easily be adapted to suit an enquiry here, and no doubt assistance could be obtained before we recommend legislation to the provincial governments rather than after we do so, and it is desirable that it should be carried out during a period of temporary depression such as we have now. I understand that the Conservation Committee of the National Council of Women, and other bodies, would be glad to co-operate in such work, and perhaps some assistance might be obtained from the Survey Department of the Russell Sage Foundation of New York.

#### **Adjusting Land Values**

One of the chief difficulties in improving conditions and securing rational town planning will arise from the system of selling, developing and assessing suburban land which prevails in some parts of the Dominion, and which in the matter of feverish speculation has no parallel in the older countries. Apart from that difficulty, our problem should be a comparatively simple one to deal with. The difference between the value of subdivided land in the suburbs and adjacent agricultural land is greater in comparatively small towns on this continent than in more crowded and rapidly growing towns in Great Britain. Such high values encourage unhealthy conditions and tend to create and maintain slums. They help to lower production by keeping large areas of good farming land in idleness round the fringes of towns, and by attracting men off the land during periods of boom. The original owners of the land do not benefit as a whole from these high values as it means that the money which is available for investment in land is invested in restricted areas, and a large proportion goes into the pockets of speculators having no permanent interest in the use of the land. Nor does the benefit of these high values often accrue to those upon whom the heavy burden of local taxation ultimately falls, for the persons or corporations which really benefit get rid of their interest before they are called upon to meet the obligations which follow the subdivision of real estate. The question of the valuation of subdivided land in the suburbs for rating purposes is rendered complex and difficult and the provision of improved and extended means of transit round cities and towns is

discouraged. On all grounds the matter is one which should be the subject of careful enquiry.

**Departments of  
Municipal Affairs**

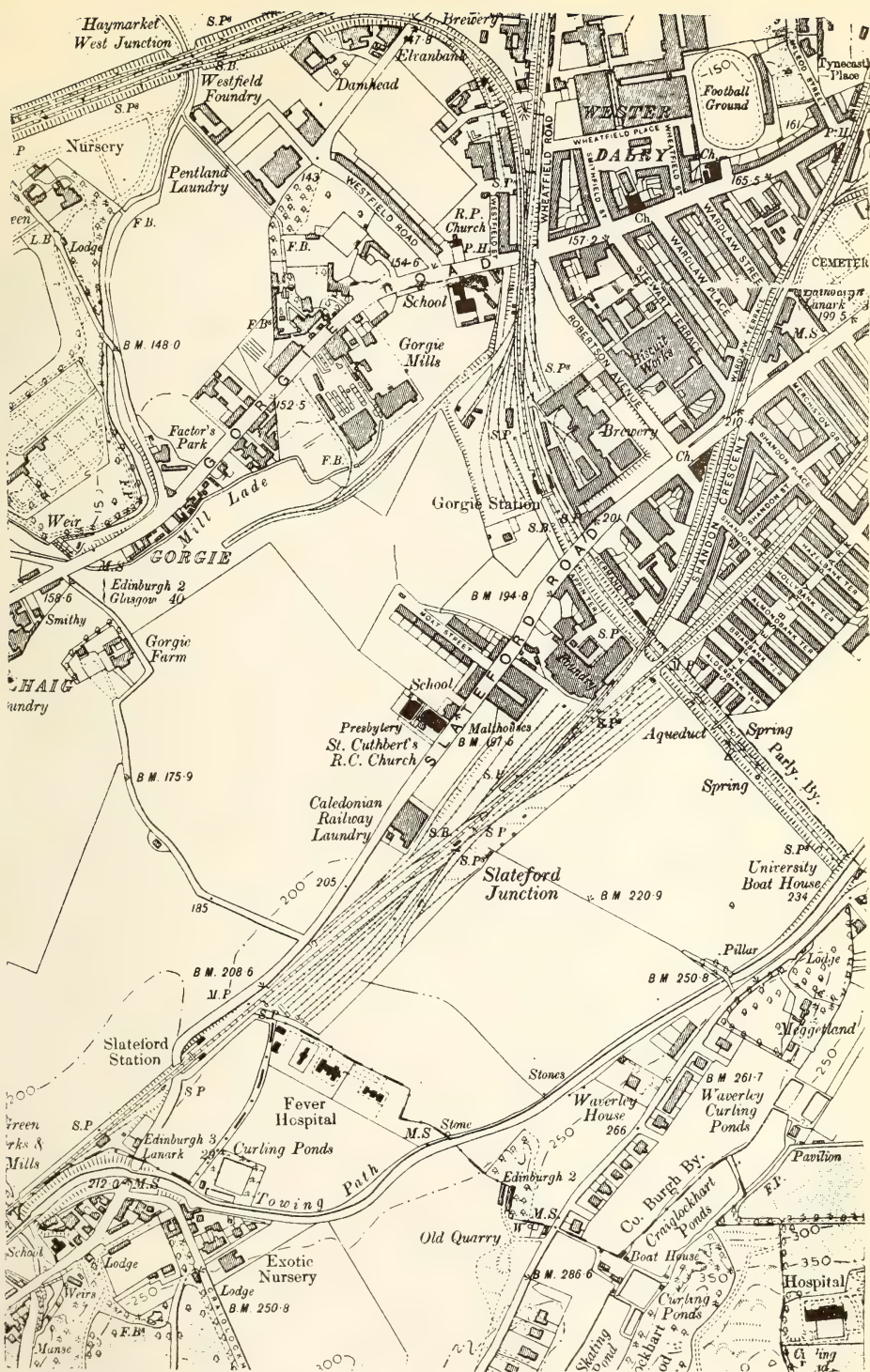
At the last annual meeting it was resolved to recommend each Provincial Government to create a department of municipal affairs corresponding with certain branches of the Local Government Board of Great Britain, whereby the best expert advice would be placed at the disposal of municipalities, and expenditure on municipal projects and improvements would be subject to approval of a central provincial department. There are departments of municipal affairs in Alberta, Manitoba and Saskatchewan. The reports of the departments show that they are filling a great need in the municipal administration of the three provinces. In other provinces a system of oversight of municipal affairs has been inaugurated without the organized machinery of a special government department, and the general tendency is towards the setting up of such machinery.

The Local Government Boards of England, Scotland, and Ireland have become essential parts of the municipal administration in Great Britain. These Boards give local finance a security it could not otherwise have ; they authorize loans and employ skilled inspectors to guide and advise in regard to local improvements, water supply, sewerage, town planning, housing, etc. Many mistakes and wasteful expenditure would result without this assistance and oversight by the department. All by-laws relating to streets, buildings and sanitation have to be approved by the Board, and alterations can only be made subject to their approval. Such alterations are always made on principle and never on the ground of local expediency. Instead of being an interference with local administration, this system in effect gives added powers to municipalities. So long as a municipality is entirely independent its powers have to be curtailed and its discretion limited, but when its work is subject to the approval of a central department its powers can be greatly increased.

Since 1909 the powers of the English and Scotch Boards have been extended to deal with town planning under Part II of the Housing and Town Planning Act. The supervision of the Board is necessary under the Act to secure practical and effective co-operation between adjacent authorities, to provide facilities for arbitration and to enable wide discretionary powers to be given to municipalities which Parliament would refuse to give in the absence of central control.

Departments of Municipal Affairs are needed in the provinces of Canada to secure uniformity of administration and procedure, the employment of skilled advisers, the linking up of public health,





SECTION OF ORDNANCE MAP OF EDINBURGH, SCOTLAND

The map shows details of buildings, etc., indicated on all small scale maps in Great Britain.  
Scale 880 feet to one inch.





housing, highway, boundary extension and town planning administration, the proper control of public utilities, the framing and application of sanitary and other by-laws on sound principles, wider powers to municipalities and the efficient and impartial presentation of municipal accounts.

A special committee should be formed by this Commission to frame a draft act which can be submitted to the provincial governments as a model. This is a matter of considerable importance in Canada, especially at the time of difficulty in connection with municipal finance, and in view of the proposed legislation on town planning and housing.

#### MUNICIPAL ACTIVITY PENDING THE PASSING OF LEGISLATION

Pending the passing of legislation to facilitate the preparation of town planning schemes there is certain work that can be done by municipalities or bodies of citizens interested in the proper development of their cities. Steps are being taken to persuade municipalities to proceed with this work. Before indicating its nature it is necessary to explain why it is limited to a comparatively small, although very important field. It is not desirable that municipalities or commissions representing groups of municipalities should prepare plans without first obtaining authority to control the area proposed to be planned, during the time the scheme is being prepared. Power for this purpose is necessary whether it be obtained by a special act to meet the particular case or by a general act for the whole province, such as is being suggested by the Commission. Many cities, particularly in the United States, have had town planning reports and plans prepared at considerable cost and have been disappointed to find, after the work was done, that it was almost impossible to put the proposals into practice. This may not have been due to any defect in the proposals themselves, but to the fact that the schemes were prepared without the municipality first having obtained power to carry them out and without regard having been paid to the cost and how it could be met. When the right steps are taken and the right order of procedure is followed, it is quite practicable to settle the financial details of the scheme during its preparation, and it has to be borne in mind that every scheme must be capable of being tested from the point of view of its economic soundness. It is not a question of sacrificing ideals or principles ; that need not follow and it is a separate matter. It is a question of the simple necessity of justifying whatever proposals are made on their feasibility from a financial standpoint.

This requires that all town planning schemes, when prepared, should be accompanied by estimates of the cost of carrying them out. To accomplish that result means that the process of preparing a scheme has to proceed along certain definite lines in conformity with legal practice and that the co-operation of owners of land has to be sought before the scheme is completed and not after it is made. Moreover, it requires that owners shall not have the power to defeat or contravene a scheme while it is in course of preparation.

The preparation of a practical scheme along these lines involves four stages of procedure, as follows :

1. Preliminary survey to determine area and obtain map of existing sociological and physical conditions.
2. Obtaining authority to control the area during preparation of the scheme so as to prevent anything being done to contravene it or any speculation in values likely to be created by it.
3. Preparing scheme and getting approval by or on behalf of the Legislature.
4. Operating the scheme after it has been approved.

**Preliminary  
Surveys  
Essential**

In a democratic country it is necessary to proceed in the above order and only the first stage can be carried out without legislation. Reasons for this method of procedure are being fully set out in a memorandum which is being prepared for circulation to the municipalities throughout the Dominion, but sufficient has been said to show that the scope for municipal activity pending the passing of legislation is practically limited to preparing a preliminary survey and map of existing conditions.

The preparation of such a map is urgent and of great importance. The customary blue-print showing the streets and subdivisions, and not even differentiating between portions built upon and vacant land, is of little value for town planning purposes. The need is for a printed map showing accurately the following details :

1. Existing and approved streets, footpaths and fences, differentiating between those streets actually formed or made and those which have been simply approved by the council.
2. Buildings erected and in course of erection, distinguishing between public buildings, factories, residences, etc.
3. Railways, canals, and other artificial features.
4. Lakes, streams, marshy land, groups of trees and other natural features.



In short, what is required is a map showing the existing development and general physical character of the area in the same way as this is shown on the ordnance survey maps in Great Britain.\* The need for such maps for Canadian cities and their environs is all the more necessary because of the extent to which land has been subdivided beyond the limits of built-upon areas of most cities.

With regard to levels, all that is necessary on the preliminary survey map is to show spot levels at frequent intervals along the existing roads, or perhaps along streams and on high elevations. Contour maps, showing precise intervals of level every 5, 10, 25 or more feet, are not necessary at this stage, although in undulating areas they will be required when the scheme comes to be prepared. In any case, the contours shown on the Militia maps (one inch to one mile) at vertical intervals of 25 feet are sufficient for most purposes of general schemes, if transferred to maps prepared on a larger scale. This is a matter which will have to be decided according to local circumstances. When the preliminary survey is completed, copies of the map might usefully be employed to show the distribution of population and of industries and the traffic conditions of the city. All that is work which can be profitably carried out without danger, in advance of legislation, but to go further is to jeopardize any scheme which it is proposed to prepare.

For town planning schemes and for general use, apart from precise engineering purposes, it would suffice if the maps were prepared on a scale of 400 feet to one inch,† so that a comparatively large town could be placed on a map of workable size, but for many purposes a scale of 400 feet to one inch, as has been followed in the case of the Baltimore survey, would be more useful. The small scale map of part of the suburbs of Edinburgh, Scotland, —880 feet to one inch—is a useful map for many purposes, but is not large enough to enable precise areas to be fixed. It shows, however, that even on this small scale the British maps give an almost accurate idea of the character of a district. One of the difficulties in connection with the preparation of such maps is that they require the services of men of special engineering training and experience, and they can only be prepared economically if the work is supervised by some one who has done similar work before. For this reason it would be of great advantage if some practical means were found to enable the Departments of the Dominion Service which are engaged in preparing survey maps to give assistance to municipalities on terms to be mutually arranged. The

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\* See illustration facing page 172.

† See Cincinnati topographical map, facing page 178.

work could be made to a large extent revenue producing and would be a good investment. In cities in America, where maps have been prepared, it has been shown that they are of great benefit and are worth many times the cost. In Ottawa, I understand, the Federal Plan Commission had to expend about \$7,000 for preliminary surveys, most of which would have been unnecessary had an accurate topographical map of Ottawa been in existence.

**Preservation  
of Trees**

It is one of the objects of town planning to preserve natural features such as trees, and in the older countries it has become an outstanding feature of real estate development on ordinary commercial lines to preserve trees as a profitable asset in connection with the sale of land. One of the most successful real estate enterprises in the United States is that of Roland Park, Baltimore. I asked the president of the Roland Park Company to inform me whether he placed any commercial value on the preservation of trees, and his reply, dated the 12th inst., is as follows :

"As to the commercial considerations involved in the question of saving trees wherever possible, my own judgment, founded upon an experience of over 20 years in this work, is that those who buy land from us value large forest trees so much that we can afford to go to very considerable expense in preserving them. I send you some photographs showing cases where we have built retaining walls to avoid making slopes which would have destroyed trees located on or near the sides of streets. (See illustration.) With the same purpose in view, we frequently leave the sidewalk at a level above or below that of the driveway. I send you a few photographs illustrating this method of treatment also.

"There are a number of advantages secured by the preservation of such trees : The direct value of the tree to the abutting lot, its value in the enhancement of the beauty and attractiveness of the street vista, and the variety and interest added to the aspect of the street by the evidence furnished by such a construction that a human problem has been encountered here and recognized, and an effort made to work out its solution with some degree of care and thoughtfulness."

I have referred to this matter as I have observed that the point is not appreciated by many who conduct real estate operations in Canada, and even the advisers of the great railway companies who have large areas to deal with appear to lose sight of the commercial advantages of preserving trees, and incur great expense in removing them, to the detriment of their own property. The public loss is still greater, and the matter is one regarding which further education of public opinion is desirable.





GROUP OF FIR TREES, BALTIMORE, MD.

The roots have been mulched to preserve the trees pending the building of a dwarf retaining wall. In many instances trees can only be properly preserved in groups, and this must be done before the land is subdivided.





SIR CLIFFORD SIFTON : I am sure you will agree that it was a wise move for the Commission to secure the services of Mr. Adams. In the very short time he has been here the clear-sighted manner in which he has sized up the situation in Canada indicates very plainly that his practical judgment will carry him through the very difficult work before him. My views as to what we should do in the near future, upon this subject, are definite. We should endeavour, first of all, to get legislation in shape and get it adopted in the different provinces. To do this, we should secure the proper officials to assist with the duty, so that we shall have in each province one official appointed for the purpose of supervising work of this character and whose business it will be to acquaint himself with the principles on which the work should be done. Having that, we have a legal foundation upon which to proceed and the work would naturally go along more harmoniously.

The next step should be to make a determined attack on the larger cities and see if we cannot bring about some practical movement in each of these, for they need attention more immediately. Montreal, I suppose, is the worst. A good deal has been done in Toronto. Something is being done also in Winnipeg. Perhaps it is not fair to say it in regard to Toronto, but in regard to the other cities, I fear they are too theoretical in their ideas, and I was very much pleased indeed in listening to Mr. Adams to see that he approached the situation on the practical and economic sides, for they are the aspects of the question that we are anxious to develop. Handsome buildings and ornamental treatment and all that sort of thing are very well, but they are not especially our business. It is the economic side of town planning in which we are particularly concerned, and it is in the large cities like Montreal, Toronto, Winnipeg and Vancouver, which are yet in the earlier stages of their development—because they will all be very large cities—that a determined effort should be made to insure that their future development will be along the lines that will conduce to the health, comfort and happiness of their citizens.

SIR JAMES GRANT : May I say a few words ?

SIR CLIFFORD SIFTON : Certainly, Sir James.

SIR JAMES GRANT : I have listened with the greatest pleasure to Mr. Adams' address upon the subject of housing and town planning. As a medical man I look upon this question chiefly from the point of view of sanitation. We realize that we are living in a progressive age and that all these subjects are now being investigated with a very much greater degree of accuracy than at any

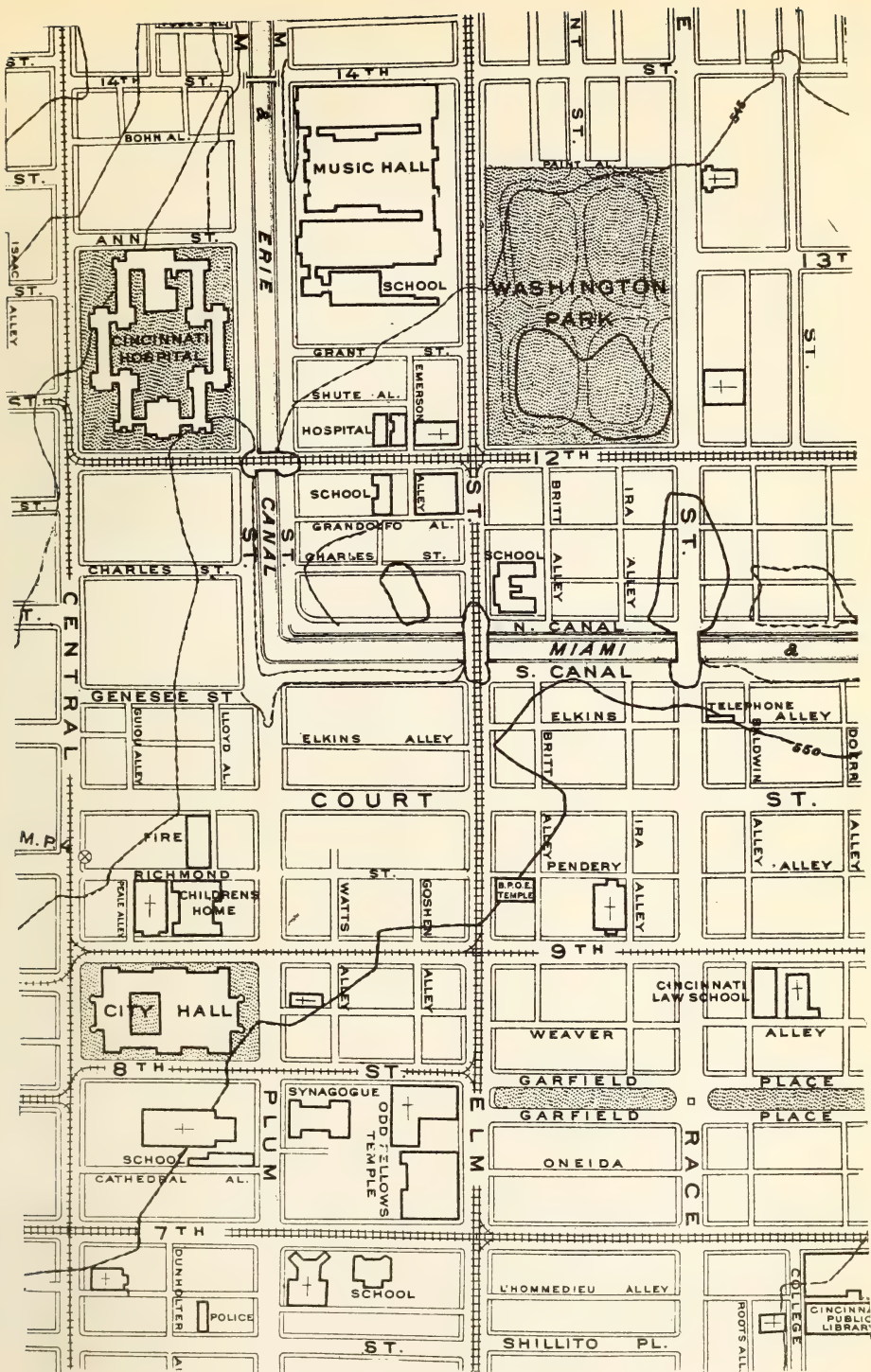
previous time in our history, and I am glad to see that this Commission of Conservation, under the chairmanship of Sir Clifford Sifton, has already succeeded in placing many points before the people of Canada which are of vast importance and of great practical utility.

On the subject of housing let me say that it is a vital problem, because it has been demonstrated by most thorough investigations that every third death in the Dominion of Canada is caused by tuberculosis. We know that in the great city of New York there have been, until recently, defined areas or sections of such reputation that they were called "tuberculosis rows." Why were they called tuberculosis rows? Because the population of the city of New York is so great, and the rentals were so high that the working classes had to congregate in these rows and occupy places where the vital capacity of the air was seriously poisoned. Now that is an object lesson for the people of Canada to bear in mind. I am, therefore, pleased beyond measure that I have had an opportunity of listening to the admirable address that has been delivered here this morning, because there is no more vital question before the nation than that of conservation of the health and lives of its citizens. For this purpose, comprehensive laws are essential, and I have no doubt whatever but that this Commission, under Sir Clifford Sifton's able leadership, will contribute in a very large degree in carrying out those principles so admirably defined by Mr. Adams. I thank you, Mr. Chairman.

SIR CLIFFORD SIFTON : I am sure we are very glad to hear the views of our old friend, Sir James Grant, and I am sure we have been doing all we could in the direction he suggests. Our medical officer, Dr. Hodgetts, has been giving every attention to that subject. We have had a Public Health Conference, under the auspices of the Commission, at which the whole subject was discussed and a good deal of advance made. Of course, Sir James knows that "Rome was not built in a day." Matters of this kind cannot be done all at once, but that subject is receiving our attention constantly and some progress has been made.

I shall now call on Mr. Donnell to read a paper upon "The Canadian Fresh Sea Fish Trade." I may say in connection with the fisheries of Canada that we have perhaps not done as much as we might have done or as we would have been glad to do, but we have not as yet succeeded in satisfying ourselves in regard to the appointment of a fisheries expert. Nevertheless, I think some of the progress made has been directly due to the work of the





SECTION OF A TOPOGRAPHICAL MAP OF CINCINNATI, OHIO

The map shows the actual scale of topographical maps required for Canadian cities. It would be complete if all the existing buildings were shown, instead of the public buildings only. Scale 400 feet to one inch; contour interval 5 feet.



Commission. Our late assistant secretary, Mr. Patton, gave a good deal of attention to the oyster question, and I think very largely as a result of his work, there has been much improvement. This is especially true in Prince Edward Island, where some of the main difficulties which stood in the way of the progress of the oyster industry have been removed and conditions are very much better than before.

It was our intention last year to appoint a fisheries expert to advise the Commission upon the subject of fisheries. The outbreak of war in Europe upset our arrangements, and we did not feel like extending our operations until a little further consideration could be given to the subject. Consequently, Mr. White, who had been instructed to secure such a man while in England last July, was given further instructions to defer the appointment.

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## The Canadian Fresh Sea Fish Trade\*

BY

ALLAN DONNELL

*Assistant Editor, Commission of Conservation*

**I**T was not until 1906 that any organized effort was made by Canadian interests to supply the markets of Ontario and Quebec with fresh sea fish. This was due in part to the fact that such important American fishing ports as Portland, Gloucester, and Boston were considerably closer to Montreal, Toronto, and other centres in Ontario than are Halifax and Mulgrave. This gave the American shippers the advantage of better express and freight rates which enabled them to overcome the duty of one-half cent (later raised to one cent) a pound. Not only that, but the Canadian Atlantic fisheries were carried on, for the most part, during the summer months only. This made the shipment of fresh fish, except in refrigerator cars, all but impossible. Consequently, the dealers in central Canadian cities found it to their advantage to secure fresh fish from American ports where the service was steady and reliable.

### Commencement of the Trade

In 1906, however, certain Nova Scotia fish dealers made arrangements with the railway companies for a Saturday cold storage car between Mulgrave and Montreal. This service is still in operation and has marketed large quantities of fresh fish in Quebec and Ontario. In September, 1907, the Department of Marine and Fisheries entered into agreements with the Intercolonial and the Halifax and Southwestern railways, which provided for the attachment of refrigerator cars for fish to the fast freight trains leaving Halifax on Saturdays and Mulgrave on Mondays for Montreal. This service was undertaken on the understanding that the Department guaranteed the railways that, on each trip west, these cars would earn at least two-thirds of the regular charge on carload lots of 20,000 lbs., in addition to costs of icing at minimum carload rates. This freight service guarantee cost the Department \$208.37 during the fiscal year 1907-1908. The following year, the first full year that the plan was in

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\* A *résumé* of what the Department of Marine and Fisheries has done to encourage the sale of fresh sea fish throughout Canada, together with certain suggestions for future work.

operation, it cost \$1,943.89. In 1909-1910 the guarantee was reduced to \$481.29, after which the service became self-sustaining. Since 1911, however, it has not been much used from Halifax, as the express service meets the requirements of that point better.

A freight service is likely to be slow and uncertain and, to offset this, the Department, in the spring of 1908, arranged for an express service. This arrangement provided for a refrigerator car to be attached to the Marine express one day a week, to transport fish to Montreal, at a rate of \$1.00 per 100 lbs. from Halifax and \$1.05 per 100 lbs. from Mulgrave. The service did not prove popular, however, and was soon discontinued. Its failure was probably due in part to the fact that it was limited to one day a week, as well as to the necessity for the consignee taking charge of shipments at the car. In the autumn of the same year, new arrangements were made with the express companies whereby one-third of the charges on shipments to points as far west as the eastern boundary of Manitoba were to be met by the Department. This gave a rate of \$1.00 per 100 lbs. from Halifax and Mulgrave to Montreal. The plan proved to be very successful and resulted in great increases in the sales of Canadian fresh sea fish in Ontario and Quebec. Coincident with this there was a decided falling off in the imports of fresh fish from the United States into these provinces. Thus, in 1906, the imports in question amounted to 1,968,572 lbs., in 1908, they had fallen to 1,180,543 lbs., and, in 1910, to 761,569 lbs.

**Refrigeration  
Essential**

It is obvious, however, that the ordinary express service, when used for the transportation of fresh fish, has distinct limitations. Hot weather in summer and the fact that the regular cars are artificially heated in winter tend to make them unsafe for such a purpose. Refrigerator cars are not only an advantage but practically a necessity. Last year, a limited refrigerator express service, from the Maritime provinces to Montreal, was inaugurated. A refrigerator express car leaves Mulgrave every Saturday, and shipments from Halifax are consolidated in this car at Truro. In addition to paying one-third of the ordinary express charges on shipments forwarded in this car, the Department has guaranteed the express companies that the earnings per trip will, at least, aggregate the charges on 10,000 lbs.

The fresh fish trade of the Pacific coast is also expanding rapidly, the halibut trade being in an especially thriving condition. Credit for this is probably partly due to the requirements of the American markets. The growing scarcity of halibut, coupled with the difficulty of securing winter supplies on the stormy Atlantic coast, led certain New England fishery interests to attempt the exploitation of the







BRITISH COLUMBIA HALIBUT, AWAITING SHIPMENT

The halibut fisheries of the Pacific coast of Canada have developed rapidly within recent years. The marketed value of the catch in 1913 was \$1,734,200.



Correspondence with some of the wholesale dealers in fish in Montreal, Toronto, and other cities indicates that the Department's plan of part payment of express charges has resulted in a marked increase in the consumption of fresh sea fish in Quebec, Ontario, and the western provinces. Some of the dealers point out that their sales of frozen fish during the winter months have also largely increased, owing to the fact that their customers have acquired a taste for salt water fish during the summer seasons. Further, it is pointed out that the Department's action with respect to transportation made it possible for the dealers to sell fish at lower prices than they otherwise could.

**Educational  
Campaign**

In addition to securing better transportation, the Department has commenced an educational campaign to encourage the consumption of fresh sea fish.

The chief feature of this work has been an extensive fisheries exhibit at the Canadian National Exhibition at Toronto. This was first carried out at the exhibition of 1913. The Department secured the co-operation of certain large dealers in Halifax, Montreal and Toronto, and were able to supply an exhibit which was one of the leading features of the exhibition. This work was not only designed with a view to educating the public as to the value of fresh fish, but also to point out to dealers the way in which such fish should be handled. For this latter purpose, a large cold-storage show case was placed in the exhibit. The exhibition of 1913 called for an outlay of \$9,700.48. At the exhibition of 1914, similar lines were followed and the Department has received assurances from many dealers that the exhibits had done much to enlarge the demand for fish. In connection with these exhibits small booklets on the best methods of cooking fish were distributed. This is considered by some dealers to be a very important feature. Unless fish is carefully cooked, it is likely to lose much of its palatableness. To quote from the correspondence of one of the leading fish merchants in Ontario : " We feel sure that the sale of fish would be more than doubled, providing the housewife knew more about preparing fish for the table. We have always been of the opinion that the biggest set-back to the consumption of fish is the ignorance of the average Canadian of knowing how to cook it."

To sum up, therefore, the Department's activities in promoting the consumption of fresh sea fish in Canada have followed two distinct lines : (1) Arranging for improved transportation at rates that would permit shippers in the Maritime provinces competing with the shippers from United States ports ; and assisting in a similar manner the shippers of part carload lots of fish from the Pacific,



to points as far east as the western boundary of Ontario. (2) Educating the retailer and the consumer as to the proper methods, respectively, of handling and cooking fresh fish.

#### A GLIMPSE AT THE FUTURE

The results obtained so far have amply justified the work of the Department. Much still remains to be done both in the matter of improving transportation and in popularizing the use of fish. In time, the express and freight guarantees now met by the Department should decline instead of mounting higher year by year as at present. There is good reason for expecting such a service to gain sufficient strength to pay for itself so that the Department could direct its energies to other features of the trade.

The education of the fisherman is a problem that must soon be faced, either by the Department or by Fishermen's Associations, or by both. The question is a difficult one, for the fisherman does not take kindly to changing traditional methods. Perhaps, however, work similar to that done some years ago by the Dairymen's Associations and the Department of Agriculture would remedy many existing evils. At all events a recognition of the need for reform is the first step to be made and there can be no doubt but that careless handling of fish by the fishermen and fish-packers results in heavy annual losses to the industry in Canada. As a Montreal fish-dealer pointed out recently : "Sticking forks in fish and walking over them does not improve them. Yet that is what is done at present."

Such methods are merely typical of others and, until they are replaced by better ones, it will be impossible to furnish the consumer with the highest grade of fresh sea fish. Similarly, much can be done to encourage more careful packing of fresh fish. There are good reasons for believing that large quantities of fresh fish are wasted every year as a result of careless packing in unsuitable packages. When these advances have been made, it will be much easier than it is at present, to popularize the consumption of fresh sea fish.

## Aspects of the Forest Fire Situation in 1914

BY

R. H. CAMPBELL

*Director, Forestry Branch, Department of the Interior*

**M**R. CHAIRMAN, ladies and gentlemen: The subject upon which I have been asked to address you, that of the forest fire situation, is one that I have discussed at former meetings of this Commission. I will, therefore, necessarily repeat some things that I have said on other occasions, and you will probably notice that I am retracing some steps that I have followed in previous years in explaining some of the Dominion forestry work. I would also explain in preface, that I have not been able to get such complete information as to make it possible to discuss the forest fire situation in all portions of Canada with any degree of accuracy. I have confined the discussion, therefore, largely to things in our administrative work about which I had fuller information.

Fires are, and still will be for some years, the great enemy of the forest in Canada. The danger to our timber supplies from this great destructive force has been iterated and reiterated until those who have heard it from year to year begin sometimes to wonder if we must always harp on the same string. But we are forced to play the one note till the country has learned it, and the returning vibrations do not as yet indicate any great or general degree of harmony on the subject.

The agitation that has been carried on for the last fourteen or fifteen years for better methods of prevention of forest fires has not been without effect. But perhaps a more potent cause of advance has been the recurring dry years which have caused great losses by forest fires and which have made the application of the lesson so sharp and vivid, that it has been brought strongly home and has forced advances that would otherwise have been impossible.

**Necessity for  
Organization** In normal years the precipitation, with but a small or inadequately organized fire patrol, is sufficient to keep the fires in control, but, at irregular intervals, comes the dry season when the high peak of danger is reached. Fires begin in different places in the dry vegetation or *débris*, the patrols are called to a dozen different points at once, the air becomes filled with smoke so that it can hardly be told where the fires are or

whether new ones are beginning. Then only a thorough organization, a trained and sufficient force, officers of administrative ability, good lines of communication and complete equipment can save the situation. Surely we have learned in the past few months that system and organization are of vital importance and that in days of peace we must prepare for war.

The year 1914 was, particularly in the western provinces, one of those years of deficient precipitation which test the strength of the defences against forest fires, and it will, perhaps, be of interest to contrast it with the nearest previous dry year, 1910. In this way, the advances that have been made in fire prevention methods may be readily seen. I will confine my statements to Dominion territory, though the same principles will affect the work in all portions of the Dominion.

**Fire Conditions  
in 1910**

There was a long, dry autumn in the year 1909 ; not much snow during the winter and an early thaw in March, 1910, followed by cold, dry weather, which made the very worst possible conditions for fire, and the dry conditions persisted, particularly in the province of Alberta, on to the middle of the summer. As a consequence, the year 1910 was one of the most disastrous years for the forests since their protection has been given any attention. The losses which occurred on the Canadian side of the border in that year became only relatively less important in comparison with the very heavy losses of forest and other property, and of human life, in the states to the south of the international boundary. The number of fires reported on Dominion territory in that year was 1,227, and the most extensive areas of fire were in the Rocky mountains in Southern Alberta. One continuous area of fire in the foothills of the Rocky mountains covered an extent of 494 square miles, and almost every man in that part of the country had to be called out to fight fire.

At that time the organization of the protective force was not at all thorough or complete. The Rocky mountains were not then being handled as a forest reserve, and the area of forest reserve elsewhere was comparatively small, amounting to only 2,725,360 acres. Even the forest reserve administration was new and undeveloped and it was not taken very seriously by the public, although the results of protection on the forest reserves were decidedly better than outside of them. Twenty rangers were employed on the forest reserves and 107 outside of the reserves. On the forest reserves only a small beginning at improvements, such as roads, trails, etc., necessary for the protection of the reserves had been made, and, in the districts outside of the reserves, nothing of this kind had been undertaken,



except such desultory clearing as a fire ranger might have done on a trail in order to get through. The equipment of the ranger districts with fire-fighting tools was not placed on any thorough basis, and it was usually difficult to get a supply at the right place when needed. No efficient system of inspection of railways, so as to ensure the carrying out of the regulations of the Dominion Board of Railway Commissioners in regard to measures for the prevention of fire, was carried out, although such an inspection had been tentatively begun during that year. It may also be added that the organization of a fire patrol service had just been begun by the province of British Columbia and was far from adequate.

The area covered by the fires on Dominion lands reported in 1910 was 345,660 acres, and the quantity of merchantable timber burned reached a total of 185,350,000 feet, board measure.

#### Fire Conditions in 1914

The year 1914 was also a very dry one. There was little or no snow in the winter and the spring and summer were very dry. From every district the reports as to the dangerous conditions were the same, and the efforts of the whole staff were strained to the utmost to meet the situation. Their efforts met with considerable success as very many fires were prevented or stopped which might have caused serious damage, but at the same time there was considerable loss, which shows that there is still room for improvement in spite of the advances which have been made since the year 1910. In all, 1,406 fires were reported on Dominion territory for the year 1914—with two districts incomplete—of these, about twelve did serious damage. The total area burned over as reported was 438,567 acres, the quantity of merchantable timber damaged or destroyed was 350,000,000 feet board measure, and the expenditure for fighting fire was \$70,000.

It would seem, therefore, as if the result in 1914 was worse than it was in 1910, in spite of the advancement in improvement works and fire-fighting organization. Outside of two fires, however, which occurred in the Rocky mountains, the damage was comparatively small. The fires that were responsible for four-fifths of the damage occurred in a district which was well back in the mountains, where there was no resident population to assist in fighting fire and where the road and trail system had not been worked out. It is quite clear that no fire-preventive plan is adequate until it is complete and that much remains to be done to give full protection.

In the districts outside of the forest reserves the unknown causes of fire are over 50 per cent, and inside of reserves less than 40 per cent. Of the known causes, settlers take the foremost place, especially outside of forest reserves, with the railways closely following,

and campers in the third place ; so that the chief causes of danger are well known and give some indication of the direction in which improvement must be worked out. In the mountain districts lightning is a frequent cause of fire, and, as it usually strikes in inaccessible places and is not amenable to law or argument, it is in some respects the most difficult to handle.

**Fire Service  
Organization**

During the year 1910, the field service organization consisted of one inspector of forest reserves and a number of chief fire rangers who acted directly under instructions from the head office. When the very large additions to the forest reserves were made in the year 1911, notably along the eastern slope of the Rocky mountains, it was necessary to provide a more intensive organization and it was, therefore, decided to divide the inspection of forest reserves into four districts corresponding to the four western provinces. At the present time the administrative work in each province is in charge of a district inspector whose headquarters are in that province. The fire-ranging outside of the forest reserves was, until the present year, under the charge of a special inspector. However, since the organization of the forest reserves has developed and the fire ranging has been better organized, it has been found more satisfactory to have the inspector for each province handle the inspection not only of the forest reserve work but also of the fire-ranging. The appointment to the administration, of a larger number of technically trained foresters has resulted in a much better appreciation of the purposes and the lines of development in the forest reserves.

Each of the forest reserves has been organized with a supervisor or ranger in charge with a staff of forest rangers under him, varying in number according to the size of the reserve. The Rocky Mountains Forest reserve has been divided into four divisions or forests for purposes of administration.

The staff on the forest reserves, in 1910, was 20, and, in 1914, it was 142, but the area had increased in that time from 2,725,360 acres to 23,024,640 acres.

**Improvements in  
Equipment**

For protection, further development has followed along well recognized lines. The improvement of means of communication is a matter of first importance in any fire preventive administration, and, therefore, considerable attention has been given to the developing of a system of roads and trails throughout all the reserves. In the year 1910, 144 miles of road had been made in the forest reserves ; this included fire guards which had been cut out along the boundaries of the reserves. There are now within the reserves some 300 miles of roads, 1,249

miles of trails, 500 miles of fire guards ploughed, 400 miles of fire guards cut, and 200 miles of telephone lines constructed. The great advantage that such a system of improvements brings in the administration of the forest reserves is very well shown by the system of roads, trails and cabins in the Clearwater division of the Rocky Mountains Forest reserve. In the year 1910, none of these trails had been opened, and, if a fire had occurred well up in the mountains, it would have meant a trip of two weeks or more to reach it, while, at the present time, the most distant portion of the reserve can be reached from headquarters in two or three days. Even this is, of course, slow and the time will have to be shortened still more if the fire situation is to be under control.

#### **How the Trails are Constructed**

The methods of constructing the trails have been very much improved. The trails are now laid out on a regular system of primary, secondary and third-class trails. The primary trails are the main trails connecting all the important points in the reserve and are intercommunicating. They are made as thoroughly and as carefully as are the roads, the only difference being that the width is not so great. The secondary trails are not so thoroughly made, nor is there as much care respecting the grade as they are to give access to special points ; and the third-class trails are as a rule merely cleared of obstructions.

When the work was begun there were, of course, some old trails, particularly old Indian trails, through the mountains, but these were usually in very bad order and were not laid out on any system that would facilitate the organization of the protective service. It has, therefore, been necessary as a rule to plan a completely new trail system, and this work is being done for each of the reserves as rapidly as possible. It is hoped that, with the older established reserves, this work will be pushed to completion within another two or three years.

#### **Installation of Telephones**

The construction of telephone lines has not, as yet, been done extensively as it is necessary first, to know thoroughly the topography of the reserve and to lay out the system of roads and trails. A telephone system is a very necessary part of a protective organization as it is the very quickest means of communication. On the reserves where the telephone system has been developed it has proved very useful. The greatest extent of telephone line which, up to the present time, has been constructed on any one reserve, is on the Riding Mountain Forest reserve in Manitoba. Every ranger district in this reserve is accessible by telephone. The consequence is: that the supervisor in charge of the reserve can immediately get into communication with any ranger



and can ascertain the conditions on any portion of the reserve at any time. The ranger, on the other hand, if he finds the conditions require additional help, or, if he observes a fire which he is unable to reach himself, will immediately communicate with the supervisor. This system worked very well indeed on the Riding Mountain reserve during the past season and the supervisor is of the opinion that the question of fire protection on that reserve has now been practically solved, provided the rangers do their duty.

#### **Construction of Lookout Towers**

The lookout tower system has been established in the past year or two, and these towers have proved of such great value that advantage is being taken of all possible lookout points, not only in forest reserves but in districts outside. It is quite evident that a ranger following a land or water route through a forest has little chance of seeing a fire unless he stumbles upon it, while, from the top of a tower which lifts him above the trees, he may, especially on any elevation, obtain an extensive view and the opportunity of detecting fire over a great area. In 1910, there were no lookout towers in use. In 1914, there were eighteen.

#### **Houses for Rangers on Reserves**

In the year 1910, all of the forest rangers on forest reserves were living outside the reserves and had to go a considerable distance before they actually reached their districts within the reserves. As a result, much of their time was lost going to and from their work and, frequently, they were not in their districts when their presence was necessary. To remedy this difficulty, houses for the rangers have been built on the forest reserves, and, now, practically all the rangers are living inside the reserves so that they can keep proper control of their work. In the larger reserves, some of the patrols are more than a day's trip and, at many places, cabins have been erected at suitable stages on the trails, so that the rangers may have proper places to stay overnight when out on their patrols. Some 27 houses and 63 cabins have been built.

#### **Fire Protection by Railways**

In 1910, the Department of the Interior carried out a patrol along the railway lines both under construction and in operation, but the railways themselves gave almost no attention to fire-patrol work or to the regulations of the Dominion Board of Railway Commissioners for the prevention of fire. Some of our officers had been appointed inspectors of the Board, but the supervision had not been at all systematized. At the present time, not only has the system of inspection by the forest service under the Chief Fire Inspector of the Dominion Railway Com-

mission been well developed and a special staff appointed for it, but the regulations of the Board have been made much more thorough and the responsibility for patrol has been placed on the railways. The results on most of the railway lines, during the past year, have been very gratifying. Of the larger companies, the Canadian Northern railway has, in our experience, taken the greatest interest in the matter, having appointed a special inspector of their own to supervise this work over their western lines. The Canadian Pacific railway has also assisted very materially. The enlargement of the area in British Columbia over which oil-burning locomotives are used has also been of great assistance. The Grand Trunk Pacific railway has, of the larger companies, shown the least appreciation of the necessity for improvement, and has not shown a strong desire for co-operation.

None of the big companies have, however, shown the utter disregard for the safety of the timber resources of the country or for the regulations of the Dominion Board of Railway Commissioners as has the Edmonton, Dunvegan and Peace River railway. Although this company was notified of the regulations of the Board of Railway Commissioners and of the patrols which they were required to keep along their line, they persisted in ignoring these requirements all through the summer. Their patrol men consisted of their regular employees, who were engaged in other duties and paid no attention to the patrol. The locomotives used by them were usually improperly screened and in defective condition. They set out fire to protect a pile of their own ties and let it run loose over the country. Of 418 fires reported by the Inspector as due to railways, 250 stand to the credit (or perhaps rather the discredit) of this railway company, and nearly all these started within the 300-foot limit from the right-of-way fixed by the Board of Railway Commissioners as the boundary within which the railway company should be responsible. The Inspector received nothing but abuse for his efforts to have the regulations enforced, but he kept record of all infractions of the regulations and the railway company was summoned before a meeting of the Board of Railway Commissioners at Edmonton on the 20th November. After the case on both sides had been presented a member of the Board expressed the opinion that the officers of the company ought to be in a penitentiary, and drastic measures were threatened by the Board if decided improvement was not shown immediately. It is hoped, therefore, that there will be an improvement during next summer, but, of course, if next summer happens to be a wet season there will not be the same danger. The company preferred to take chances all through a very dry season.

**Improving the  
Personnel of  
Service**

But, while these mechanical helps toward a better administration are of importance, they can not, in the forestry administration, any more than in the army, take the place of the proper spirit and determination in the men engaged in the work. I think I may venture to assert that the spirit which the staff display in their work is better than it was in the year 1910, that their work is more intelligently directed and that the results are better. One important method by which this has been brought about is by having meetings of the officers, and especially of the rangers, once or twice during the year, when they can discuss their work and the methods which have been followed in the different districts, improvements which have been suggested elsewhere, and thus a better feeling of responsibility and of public service is established. While it can not be claimed that all of the rangers are conscientious in the work, I may cite as an example of the work done by these men, for which they get very little recognition, the case of one ranger who was quite ill with dysentery when a fire occurred in his district. He fought the fire for three days and three nights almost continuously without being able to take anything more solid than a drink of water. Men who take their duties so seriously are entitled to the greatest consideration, but, under the present system, the reward which such a man may look forward to is that, in case of a change of Government, he may be dismissed from the service if some one else wants his position.

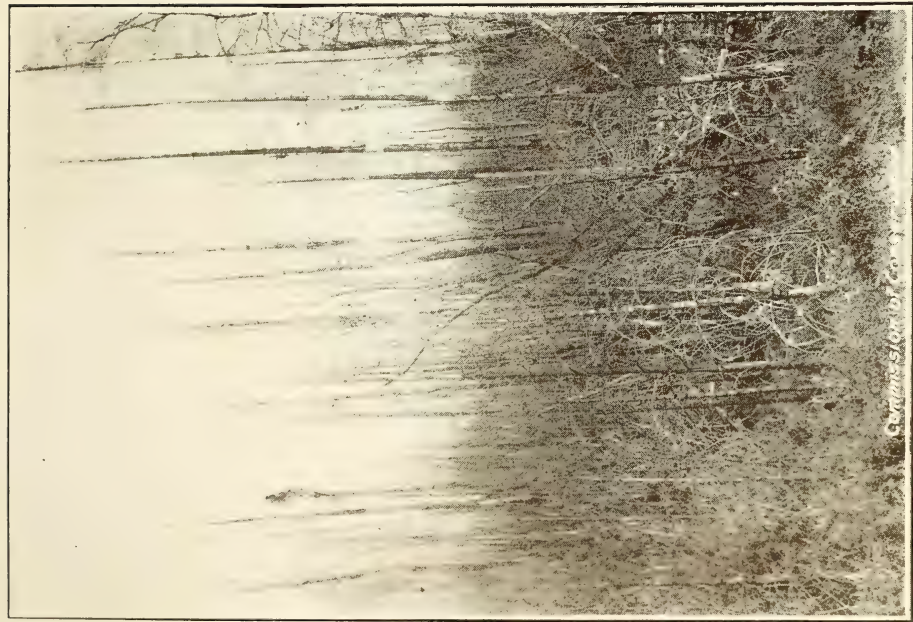
**Essentials for  
Forest Policy**

In conclusion, let me state briefly four things which I consider essential for the establishment of an adequate forest policy to protect the forests of

Canada :

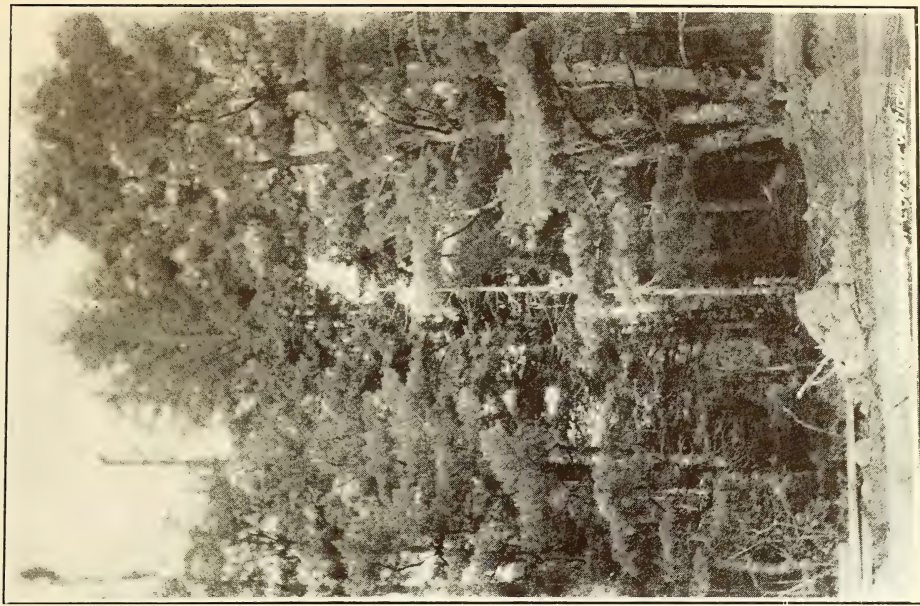
1. The development of the forest reserve policy until all non-agricultural lands are included, and the carrying to completion of the system of improvements above referred to so that protection may be effective.
2. Teaching of the value of the forest from the business point of view. The forest has been regarded almost too much from the romantic or æsthetic side, and, in consequence, business men have failed to grasp its part in the development of the business of the community. In Scotland, at the present time, there is a strong agitation for the development of a forest policy which will provide for the planting of large areas of the bare moors in the Highlands with two objects in view: first, the producing of more wealth from the land than it can produce from grazing, for which it is now used ; and, second, for the increase





NATURE'S UNSUCCESSFUL EFFORT TO MAINTAIN  
A FOREST COVER

Two forest crops on this land in Colchester County, Nova Scotia, have been destroyed by fire since 1849. Millions of dollars worth of timber could be produced on non-agricultural lands if fires were kept out.



SECOND GROWTH WHITE PINE, SHELburnE COUNTY,  
NOVA SCOTIA

Natural regeneration following fire of 80 years ago. Large values can be obtained in this way if fires are kept out.



of the population ; and, finally, from these two, the development of business. The same attitude was found in the Gironde in France, where, at one time, such area of the sand land as his voice could carry over was sold to any person for 25 francs. As a result of reforestation, such land is now almost a gold mine to the private owners and the Government, besides protecting the agricultural districts and greatly increasing the population of the district. If business people could be made to realize clearly that the attempt to farm absolute forest land in their own district will be a detriment to the district instead of a help, and that, particularly in the western provinces, cities and towns which have timber resources behind them are in a very much better position to build up industries than others, it should go far toward a better apprehension of what the forest policy means and its importance to their future.

3. The possibility of infusing a proper spirit of public service into any organization depends a good deal on the possibility of ensuring officers whose duties are of a permanent nature, that if they do their duty efficiently they will be continued in service. It is, therefore, very important that permanency of tenure of office during efficiency should be secured by such statutory enactment as may be necessary.

4. Legislation should be provided by the other Provincial Governments similar to that in force in British Columbia, giving the fire rangers control of the setting out of fires for the clearing of land so as to prevent their being started at dangerous periods and to ensure that proper precautions are taken before fires are started.

I am satisfied that the best policy for the development of our prairie country in the West is to devote the southern sections to agriculture and the northern sections to forestry. It has been demonstrated that a very large proportion of the land in the northern areas is not agricultural land and the policy that is to be followed with such is going to mean a great deal for the future prosperity of those western provinces. It is just as important that those northern districts should be handled as a forest area as that agriculture should be developed in the southern districts. For instance, take the city of Prince Albert, Sask., just at the southern boundary of the forest belt. That city, standing as it does between the agricultural country on the south and the forest on the north, is at one of the most important points in the whole province, and one which should make it possible to build up perhaps the greatest city



in Saskatchewan. To do this, it is necessary to secure a stronger support for the permanent setting aside of the non-agricultural area in the north, so as to develop a proper forest policy in connection therewith.

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SIR CLIFFORD SIFTON : There is one point which Mr. Campbell has made to which our attention ought to be constantly directed, and that is the necessity of getting a change made in the method of appointing the officials of the Forestry Branch. As it is now they are appointed by the old method of political patronage and sometimes, by accident, a good man is secured, but it is only once in a while. These are the kind of men with whom Mr. Campbell has to work. He has some technically qualified men, but he has some who, to put it mildly, are not technically qualified. The Commission has frequently urged the Government for a reform in connection with this matter. Deputations have been sent to the Prime Minister and to the Minister of the Interior to urge the establishment of the promotion system, and the putting of the officials of the Forestry Branch on the permanent list, the members to be qualified appointees of the Civil Service Commission, who would be promoted only as a result of merit. We intend to persevere until that has been done. I do not know whether the accomplishment of that end is imminent or not, but we have done things that were more difficult than that and I think we will probably get results after a while. I wish to enlist the co-operation of all gentlemen at this meeting, so that every time any one of you may get a chance to speak to a member of the Government, you will just take five minutes and try to impress on him that he cannot be considered as doing his public duty until this reform has been brought about. It may be that after awhile the members of the Government may feel a little like the unjust judge, that though they fear not God, yet they will do it because we ask them.

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## Forestry Situation in Quebec

BY

G. C. PICHÉ

*Chief, Forest Service, Quebec*

THE Forest Service of Quebec was reorganized in 1909 by the Hon. Jules Allard, Minister of Lands and Forests. It received more extensive and more definite powers, and a vote of \$55,000 was placed at our disposal. At that time, the personnel was composed of two forest engineers, three civil engineers, fifteen student assistants, and some eighty rangers, explorers, etc. In 1915, we have a staff of twenty forest engineers, two civil engineers, fifteen expert scalers or special agents, and eighty forest rangers, explorers or guides, and the vote has reached \$100,000. As you will notice, the number of non-technical men has remained stationary, whereas quite a number of experts have been added to the force. This was the weakness of the former service ; as, to approach the lumbermen, to discuss with them the methods of exploitation of their limits, and to give decisions where difficulties arise, qualified men are necessary, who must be clothed with more authority than is usually given to an ordinary ranger.

### Work of Forest School

In order to recruit such men, it was necessary to provide for a forest school, which was established in 1910, at Quebec. The students there take a three years' course and work in the ranks of the Provincial forest service during their holidays, so that, when they graduate, they are familiar with our conditions and with the task they are called upon to perform. The results of this system have been very good. Out of twenty-six forest engineers who have graduated from the Laval forest school, we employ eighteen, the others having secured employment with some of the lumbering concerns in Quebec, or are working on their own account. I may mention that one of our men is now in charge of the Arboricultural Branch of the Department of Agriculture of Quebec, whilst another is one of the engineers in the Quebec Department of Roads.

Now that we have succeeded in recruiting a technical personnel of some value, we expect to devote our attention to the training of forest rangers, who would be of value, not only to the Government but also to the lumbermen ; and, before long, we expect to establish

a school for rangers. To complete this educational movement, we would have liked to have some of our men lecture in the different centres, but this may not be done for a few years, as at present there are other subjects demanding attention.

**Ownership of Quebec Forests** As you are aware, the province of Quebec has a total forest area of some 130 million acres, of which 45 million acres have been leased to the limit-holders, five million acres belong to private individuals, and the remainder, some 80 million acres, is in virgin forest.

We have had very little to do yet with the management of the private lands, but we know that there are many reforms that should be made, and it is one of the problems that will be considered in the near future. We would like to establish a system of co-operation with the private holders so as to place their wood-lots under a permanent system of exploitation. At the present time, our activities in this field have been limited to the re-forestation of waste lands and I may say that this movement has aroused a good deal of interest in the province. The demands for young trees are now coming in greater number each year, so that we have had to increase the capacity of our forest nursery at Berthierville.

**Danger from Speculation** To protect our timber lands from the encroachment of land speculators under cover of colonization, we have to maintain an active watch over the lots sold each year. As soon as we have collected sufficient proof that the occupation of the land is not *bona fide*, a report is made asking for the cancellation of the sale. Often our action is completed by the collection of heavy fines imposed upon the timber which has been cut by trespassers. This rigid control has caused a diminution in the number of lots sold each year, but we believe that a better class of settlers has come to the front, knowing that they would be encouraged and protected against the land speculator.

**Classification of Lands** During the past year much time has been devoted to the classification of lands, nearly 500,000 acres being so examined. One of the causes of bad lumbering in certain sections of our province has been the uncertainty of the limit holders whether their limits would vanish under the attacks of land speculators, resulting in a sort of a race between the lot-seeker and the limit-holder, the latter trying to cut the timber as quickly as possible in order to forestall any efforts of the former to secure it. By a rigid inspection of the lots and a thorough classification of the townships, these elements of disturbance have now disappeared and the lumbering is taking a more steady course.



On the south shore of the St. Lawrence, we have even succeeded in creating reserves in which no sale of lots will take place within ten years. We did not contend for a longer period as we are certain that, within this time, public sentiment will be sufficiently educated to allow us to continue this policy without any difficulty.

**Explorations of  
Virgin Forests**

The Forest Service has been charged also with the exploration of vacant lands and, last year, our men made reconnaissances over some 8,000 square miles of territory. The information gathered has allowed us to offer some of these lands to the public, as timber limits, and a sale was made last October. Notwithstanding the disturbances caused by the war, the average price, per square mile, was much higher than any former sale.

**Control of  
Lumbering  
Operations**

Our control of the lumbering operation has been successful, thanks to the hearty co-operation of the limit-holders. In the pulp and paper districts there is absolutely no reproach to be made to the operators, as the stumps are cut low, the tops are small, etc. ; in fact, the lumbering is more conservative than we dared to recommend in 1909. To encourage this good movement, and also to reduce the dangers of fire by minimizing the amount of *débris*, the Hon. Mr. Allard, Minister of Lands and Forests, has decided to give a rebate of 50 per cent off the stumpage dues, for all logs less than six inches in diameter at the small end. Many lumbering companies have established a forestry branch of their own, or have appointed a certain number of inspectors, to control their logging operations and are co-operating with the provincial service to the fullest extent.

Much attention is now paid to the rapid exploitation of windfalls and of fire-killed and insect-killed trees. The Government gives a reduction of stumpage in each case to stimulate the removal of these trees before they are too much damaged.

**Technical Work  
to be Undertaken**

In the domain of forest entomology and mycology we have not done very much ; first, because of the lack of technical assistance, and, secondly, on account of pressure of other work. We are trying to correct this deficiency as quickly as possible and two of our young foresters are specializing in these important studies. Though our forests have not suffered very much of late from the attacks of insects, we have to deplore the decline in the reproduction of balsam fir, and, in some places, of spruce, as a result of the defoliations by the spruce-bud worm. The forest tent caterpillar has been very active during the last three summers, but, thanks to the Dominion Bureau of Ento-

mology, our farmers have been instructed respecting preventive measures which will soon check this insect.

**Reforestation of  
Waste Lands**

In many sections of Quebec, we find farms where the light soil, uncovered by undue clearing or impoverished by a wrong system of cultivation, has become transformed into drifting sand, which has extended upon the adjoining lands. The sandy wave buries the good soils, and, if not checked, results in very serious losses. As found by the French foresters, who succeeded in reclaiming the immense sand dunes of the Gascogne district in France, the best method to deal with this problem is to establish, first, a temporary cover with beach grass, then later, to plant with appropriate trees. We started similar work three years ago at Lachute, and we have now 150 acres sown in beach grass and about 50 more completely reclaimed with white pine, Scotch pine, spruce and green ash. Another experiment was carried out last autumn along the main line of the Canadian Pacific railway, in the vicinity of Berthier Junction, and we expect to pursue this work vigorously next spring. As stated above, the reforestation movement is now assuming much importance and we can expect much from this policy of bringing unproductive lands again under cultivation.

**Protection from  
Forest Fires**

Though the protection against forest fires does not come under our jurisdiction, I believe it to be my duty to mention here the excellent work done by my colleague, Mr. W. C. J. Hall, who, with a small staff and a small appropriation, succeeded in protecting efficiently the vast area under his care. The lumbermen must also be congratulated and we can mention with pride the excellent organizations of the St. Maurice Valley and of the Lower Ottawa which were the first of the kind in Canada.

Gentlemen, I believe I have said enough to prove to you that the forestry question has received the fullest attention from the Quebec Government. I have not the least doubt that, with the support of the authorities and the co-operation of the lumbermen, we will be able to do much more. Our province is rich in forests and in water-powers, the necessary elements for the manufacture of pulp and paper, so that we may look with confidence for a great future in that direction. But I expect also that the present cut of one billion feet from the forests under license can be increased largely, without any damage to the normality of the stands, provided certain precautions are taken ; that is, provided technically trained men are employed by the limit-holders to prepare their working plans. The cut from the private lands now exceeds 800 million feet.

I think it could also be increased by judicious management and a systematic reclamation of the waste lands.

The future of forestry in Quebec is, therefore, very bright. Situated at the door of Europe, we should be able to dispute their markets with any of our former competitors. But I believe, if the reports received are correct, that before long Norway will be obliged to import pulpwood from Finland, and it is our duty to be ready when the time comes to take advantage of these new conditions.

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SIR CLIFFORD SIFTON : I regard the paper just read as one of the most interesting and valuable we have had since this Commission was organized. It shows a most remarkable, practical, progressive improvement in the forestry work of the Department of Lands and Forests of the province of Quebec. It gives us an illustration of the fact that the mind of our French-Canadian friends is entirely practical, and, while there has been perhaps a little more talking about improvement in other provinces than in Quebec, the latter has certainly done more in a practical way than any other, except, possibly, British Columbia. British Columbia has acted very vigorously and very intelligently ; it was to be expected that it would, because British Columbia depends so very largely upon timber for its revenue. The outline of the work in Quebec given by Mr. Piché is, to my mind, very encouraging and very inspiring.

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## Work of the Committee on Lands

BY

JAMES W. ROBERTSON, C.M.G., LL.D.

*Chairman, Committee on Lands*

**M**R. CHAIRMAN, ladies and gentlemen: I do not propose to review at any length the work of the Committee on Lands, but only to indicate the larger aspects of its work and what we propose to do further. From the conservation point of view, the conservation of farm lands and the success of farming depend on four main points: First, putting the land to its best use in such a way as to get crops of the largest quantity and of the best quality; second, maintaining, and, where practicable, increasing the fertility of the soil; third, keeping the land reasonably free from weeds, injurious insects and diseases of plants and animals; and, fourth, applying labour economically and effectively, that is, in such a way as will secure a good living for all the workers and a reasonable profit, and, in addition, will make the conditions satisfying to the workers, so as to attract a larger proportion of our population to farms. These, I regard as the aspects of successful farming that concern the conservation worker. There is nothing in conservation principle or practice opposed to successful and satisfying farming.

### **Review of Past Work**

In the beginning of its work the Committee on Lands set out to learn whether farming as practised in Canada was in accord with sound principles of conservation. We had heard a good many assertions as to the progress and superiority of Canadian agriculture. However, current opinion on many things is sometimes misleading. Not infrequently, the man with a loud voice is heard so far and so often that his sentiments are taken to be the opinions—and actually become the opinions—of a population more quiet and reserved. A friend in Ireland remarked to me once that thinkers and workers on this and other important subjects, should “choose their gramophones with care.” Our Committee undertook to collect information by first-hand investigations, securing the testimony of the farmers themselves. They were the only people who could tell us from their point of view what was going on on their farms. We made inquiry: (1) As to the conditions of fertility, its maintenance, its increase or decrease, as the case

might be ; (2) As to the prevalence of weeds ; (3) As to any other hindrances ; and (4) As to effective and successful methods and systems, in the actual operations on farms. A schedule was drawn up and reports prepared on some twenty different points of farm practice. That has been continued during four years. There has been sufficient time, therefore, to accumulate information and it has been done on a sufficiently wide area to make the information representative of farming in Canada. To make it quite representative, districts were chosen in every province and groups of about thirty farmers in each of the districts. We had altogether 62 groups of farms surveyed, or, in all, 2,245 farms. With that number of farms and farmers the over-estimate and the over-statement of difficulties by one man would be just about balanced by the under-estimate of another man. The average would represent about average conditions.

**Character of  
Information**

The farmers gave the information very willingly. It was affected—as such information always is affected—by the temperament and by the financial standing of the farmer. When allowance has been made for such matters you still have the composite opinion of the farmers themselves on Canadian farm conditions.

There are plenty of difficulties and plenty of hindrances and we have been able to define them with more clearness and care than ever before. What does the survey of these farms reveal ? The details have been printed in the Commission's annual reports and I do not want to trespass on your patience by presenting particulars, concerning which you would rather sit down and read and analyze carefully. The survey reveals, in three important directions, certain farming conditions, or sets of conditions, throughout the Dominion. As to the quality of the grain grown and the yield per acre we found that, on the 2,245 farms, 30 of the farmers in every 100 report about the same yield per acre as ten or twenty years ago, allowing for favourable and unfavourable conditions of weather ; 40 per cent report some increase in the yield ; and 30 per cent report a decreased yield per acre. That is not at all satisfactory. After all the efforts of the municipalities, of the Provincial and the Dominion Departments, to help the farmers during the last twenty years, it is regrettable that 30 per cent of them say that their crop yields per acre are less than formerly and only 40 per cent report some increase.

**Weeds and  
Plant Pests**

Again, there is a very serious increase in the kinds of weeds. In certain districts the introduction of new and very noxious weeds is quite frequent. Some of them spread with such alarming rapidity that the farmers

admit that they are in danger of being forced to abandon the land. We have areas, by the square mile, where the people have been forced to leave their farms because of the invasion of the weeds. I could name townships from which the people have departed because the weeds took possession. That is an invasion we should not submit to. The weed is a persistent enemy. In season and out of season it keeps up its activity and it must be fought with the same kind of persistence. The increase of the "established" weeds in some cases is very serious. We have uncommon difficulties in our climate ; and our farmers are short of labour for the acreage which they attempt to cultivate. In consequence, we have the largest amount of weeds per acre of any country in the world.

**Farm Labour  
Difficulties**

The labour problem is also a vital one. There is not enough farm help available, and what is obtainable has not had sufficient training to do farm work economically. Moreover, such labour as there is is not economically applied for want of a system of farming which utilizes the labour throughout the whole year. That is a great handicap. The farmers are rushed for three or four months in the summer during which there is a spasmodic demand for labour. Then, there is a further waste of labour from the use of inadequate machinery and implements on the farm. We have in Canada two extremes. In the West, the farmers suffer from the successful salesmanship of implement manufacturers or their agents. That portion of the country is greatly injured by the assiduity with which men of that kind push new and costly machines on people who are not ready for them and who are not able to pay for them. Then we are suffering in the eastern provinces through the continued use of narrow-working implements, requiring much man-labour to cover a small acreage. These are the main difficulties as ascertained by our surveys.

**Rotation  
of Crops**

The best conditions were found on the farms where systematic crop rotations were adhered to. In the several groups that varied from 11 per cent of the farms up to 66 per cent. That is to say, on these farms there was some systematic rotation of crops. On the average, for all Canada, only 28 per cent of our farmers professed to follow systematic rotations of crops. These are men of intelligence who plan ahead. There is no possibility of farming successfully and with any sort of satisfaction, unless there be a systematic rotation of crops. As far back as the Roman Empire the farmers knew this and planted legumes alternately with other crops. It has become the practice of other nations. Canada has lagged behind in that respect. On those farms in our surveys where the best practice prevailed, there were better methods of



cultivation, wide-working machinery, and, therefore, the same number of men could grow larger and better crops and at the same time keep the land reasonably clean. By care and intelligence in the selection of seed, and the more equitable distribution of labour over the year, brought about by a system of rotation and the keeping of live stock, much more satisfactory results were obtained from the labour.

**Selection of  
Illustration  
Farms**

From the information obtained by the surveys a selection was made of one of the best farms in each group. The farmers themselves, in conference with the Commission's expert, chose the farms in their communities upon which they could have examples of improved methods of farming illustrated. These, when proved to be beneficial, were to be applied to all the farms in their districts. The Illustration Farmer, thus chosen, received no salary. He became not the beneficiary of the public through political patronage ; but, by the choice of his neighbours he became their leader whom they would willingly follow. They did not need to follow his vagaries, if he had any, in regard to philosophy or theology or politics. It was not necessary to consult church or party in selecting the Illustration Farmer. He retained his ownership and full control of his farm. At the same time he received counsel as to systems of rotation and methods of cultivation, the selection of seed, the growing of clovers and grasses, but the general administration of the business affairs of the farm was directed entirely by the Illustration Farmer himself. He received all the financial returns resulting from the better crops. The illustrations benefited the community also. The arrangement with each Illustration Farmer was to last until he had harvested three crops. By the end of the third year, that is, at the end of the season of 1915, we are entitled to learn from the farmer his opinions and conclusions as to whether the plan has worked out satisfactorily. After all, in an enterprise such as the illustration farm system, the first test of success is, does it pay ? It is not, does it sound well, look well and conform to certain theoretical principles, but, does it pay ? Does it pay in crops and profits ? Does it pay in the resultant fertility of the farmer's fields according to the farmer's own estimate of increase and maintenance ? Has the plan resulted in the decrease of weeds and in putting them under control ? Has the farmer been shown how to apply labour to more advantage and has he been able to secure enough labour of the right kind ? The answers to these questions can best be given by the farmers themselves. There has been keen and cordial co-operation between the Illustration Farmers and the Commission ; there has been confidence on their part and

great expectations of benefit. All of them say they have already secured better results after two years than they expected to get in three. They have larger crops, cleaner fields, more money, and a pride of achievement, all of which are of prime importance to Canadian farmers.

**Results  
Obtained**

I would like to give a number of examples to show the benefits derived from following an intelligent rotation of crops. The farmers in Quebec as much as in any other province are a thrifty and industrious people, but they have not followed any systematic rotation of crops. The common practice is to let a meadow lie unbroken for ten or twelve years with the result that they get less than a ton of hay to the acre on many farms. Here is one example from an Illustration Farm which is typical of others. This farmer had a meadow seeded down with the mixture recommended by the Commission's expert ; and last summer, which was not a very favourable summer, he had two and a half tons of hay to the acre in the first cutting and a second crop for clover seed together with a ton of hay. According to his own statement, which was corroborated by his neighbours, that was the best crop of clover he ever had on his farm. Another Illustration Farmer has adopted a three-year rotation system for his farm. As a result he has increased the yield per acre and has seed grain to sell. Another farmer in one of the western provinces, where rotation is not so easy as in the East, has turned the whole of his half-section into six 50-acre fields, leaving twenty acres for minor crops. One 50 acres he seeded to hay and clover and adopted the six-year rotation, which is followed at the Dominion Experimental Farm at Indian Head.

Heretofore, the farmers did not do much, if any, after-harvest cultivation to eradicate the weeds and prepare for the next spring's seeding. Within thirty or forty miles of Ottawa, an Illustration Farmer was induced to practise after-harvest cultivation on 25 acres in 1913, and in 1914 many other farmers in the vicinity were following his example. They have done so because they could see the results. After-harvest cultivation is being carried on on hundreds of farms now, owing to the illustrations brought about by the Commission through its Illustration Farms. The method was known before, but it had not gained practical recognition from the farmers generally.

**Implements and  
the Labour  
Problem**

Farmers are learning that wider implements and machines are a great factor in solving the farm labour question. One farmer in Quebec, who formerly used a small wooden harrow and one horse, now has a large-

sized iron harrow and a three-furrow plough. This has economized labour and has improved the cultivation of the farm so that the Indian corn which he has commenced growing as part of his rotation yielded one-third more per acre. A similar instance in Ontario may be cited. On the farm in question a boy with four horses on a roller, to which was attached a wide harrow, was able to cover twenty acres a day. With the old-fashioned, narrow implements one would require ten men to do that and the work would not be done any better. These are examples of the results of illustrations of the best ways of doing farm work.

#### **Advantages of Pure Seed**

Let us next consider the matter of pure seed. One Illustration Farmer had 300 acres of oats last year from which he is selling seed oats at one dollar a bushel ; another has 1,000 bushels of seed corn and is getting two dollars a bushel for it. These are results from systematic rotation, better cultivation and the selection of strains of seed that thrive best in the districts in which they are grown.

Consider the question of thick and thin sowing of grass seeds and clovers. Not three per cent of the farmers of Canada use enough clover seed or enough grass seed per acre when seeding down. Clover seed has usually been imported from the United States. When a severe winter came, it was very common for the clover to be winter-killed. Now when a farmer sows up to eight pounds of clover to the acre instead of two, and ten pounds of grass seeds instead of four he gets a better stand ; and if he sows home-grown seed the risk of winter-killing is very much reduced. One Illustration Farmer had six acres on the back portion of a field seeded down with clover and grass according to the Commission's recommendation. It was a much heavier crop than that on the rest of the farm. He was asked : is the land better ? He said, no. Then he was asked how he accounted for the difference. He said, it was because of the cultivation the first year under the Commission's plan and the difference in the quantity and quality of the seed used. He had more than twice as much hay per acre on those six acres as on the other parts of his farm. I saw other Illustration Farms with results like that. These are not merely typewritten records, they are written on the fields and written in the judgment of the leading farmers. One can make a statement in the press or can issue a bulletin ; it sounds and looks right and probably is right ; but it does not get into the minds of the people or into the practice of the people, as it does when it is seen on a farm. Many of these Illustration Farmers are growing their own clover seed, who formerly thought that they could not produce it.



**Production of  
Clover Seed**

An Illustration Farmer whom I visited recently had 1,200 pounds of choice clover seed from the crop of 1914, the first time he had ever grown any. This seed was worth \$264. Had this second crop of clover been pastured, as is the usual practice, it would not have been worth \$64. He had from this practice on that small acreage \$200 more produce, as well as more knowledge, and the land kept in better condition.

I think I have said enough to show that the Illustration Farms have done more, and will do more, than we ever expected. They have brought about other improvements which I will not even enumerate now, much less describe. There is a great deal of rough land in Canada that is becoming infested with weeds for want of a fighting plant that can hold the place. In the struggle for existence it is the plant that can fight best that will survive. It is the survival of the strongest. By sowing on a rough pasture the seeds of strong aggressive plants, these will prevail and there will be splendid pasture where formerly it was mostly weeds. Illustrations of that are in progress. I remember as a boy helping to sow soiling crops for the dairy herds on the old farm in Ayrshire forty years ago. I remember when I first became Commissioner of Agriculture and Dairying, trying to get that done all over Canada as fast and as far as I could. Illustrations are succeeding where addresses and publications often failed.

Something useful has been done with farm gardens. Women in many cases had no farm gardens. By encouragement and illustration much has been done ; the Illustration Farm garden is playing its part.

**Young People  
on the Farms**

Again, the Illustration Farm idea is doing much to keep the boys on the farm. I have in my possession at the present time a photograph of an Illustration Farmer surrounded by his six sons, all keenly interested in farm work. The Illustration Farm has opened up a new life for them that means profit and satisfaction. I have been delighted with the interest the boys take in this kind of farm work. It is work on a plan which calls for a man's management and which, in its application, calls for and develops skill.

**Plans for  
the Future**

Many forces and many influences are at work to improve agriculture and rural life in Canada. We were all delighted with what Dr. C. C. James told us of the assistance which the Government of the Dominion of Canada is granting to all the provinces through *The Agricultural Instruction Act*. We appreciate the fine statesmanlike policy and methods that have

been followed in Dr. James' negotiations for the Minister of Agriculture, with all the Provincial authorities. All that is indeed fine constructive work which reflects great credit on the Minister of Agriculture, for whose ability and public service I have had sincere admiration for a long time before he became a Minister of the Crown. It is also greatly to the credit of Dr. James, whose insight into farming problems and whose constructive powers and genial manner have made him one of the great public servants and benefactors of Canada. But there is still much more to be done. I put into seven classes or divisions all the co-operative undertakings between the provinces and the Federal Department of Agriculture through *The Agricultural Instruction Act*. I shall not detain you by dealing with these, at any length. I present them in outline only. They all receive financial and other assistance, under *The Agricultural Instruction Act*.

1. Agricultural instruction at institutions in respect of build-  
ings, equipment, and salaries.  
Veterinary instruction.
2. Elementary agriculture at schools, including nature study,  
school gardens, and domestic science.  
Boys' and girls' clubs.
3. Short courses for farmers, for women and for teachers.  
Judging and packing competitions.
4. Demonstration farms.  
Demonstrations on farms.  
Demonstrations on trains.  
Field-crop competitions.  
Control and destruction of weeds.  
Investigations concerning tobacco growing.
5. Farmers' institutes.  
Cow-testing associations.  
Women's institutes.
6. District representatives and provincial officials for the im-  
provement of agriculture.
7. Marketing and co-operative societies.

I have made this rough analysis chiefly for the purpose of examining whether all the grants available for such undertakings are being taken advantage of, as far as practicable, in any one county ; and, if not, whether any steps could be taken that would enable all the rural population of a whole county to obtain the full benefit of them. There is no one part of any province that has in actual operation all that is easily practicable for it.

**Illustration  
County  
Suggested**

I now hope for, and desire, an Illustration County, after the plan of our Illustration Farms. In it, there could be tried out, and put to the proof, the theories and concepts of the best things that have been found useful there, or elsewhere. We need such a district where all the several activities of all these various agencies could be seen properly co-ordinated and at their best. The first step would be to conduct a thorough survey of a district, a county for example. For that, the hearty co-operation of provincial authorities and municipal authorities would be sought. The Commission of Conservation is the most appropriate and competent agency through which the survey could be conducted. The survey would deal with such questions as : (1) farm labour, (2) co-operation, (3) roads and transportation, (4) education, and (5) opportunities for recreation and the development of a richer social life. In every one of these matters the problem has been solved, at least for the present, in some instance or some district. Let us suppose that the Commission discovers that a plan or method has been found adequate and effective in some rural community. Can the same or another method be enlarged and developed into a system suitable for many cases or several communities ? Can the same, or other methods, be organized and applied to serve a whole county ?

**Problems  
Awaiting  
Solution**

Every one knows that farm labour is scarce, but how scarce is it ? How could enough be provided, and how could it be satisfied in the matter of wages and housing and prospects ? Then, after the survey, the Commission should seek the continued co-operation of municipal, Provincial and Dominion bodies and authorities to bring about a practical *illustration* of how the needs discovered could be met in the best way. I would go as far as to ransack Canada, and even Europe, through the Immigration Branch, for families especially suited for that class of settlement as farm labourers. If the effort did not succeed, we would find the reasons and causes. If they cannot be removed or remedied, then that part of the plan may be abandoned. If the plan succeeds, it can be extended. The effort would at least shed light on one of the big problems of the day, the getting of sufficient competent labour for the farms.

In some rural communities there is sometimes some form of co-operation among farmers in carrying on farm work, such as the threshing bee, the joint use of a spraying machine, etc. In this Illustration County we want to have tried out methods of co-operation in working and in buying and in selling. Some have been found valuable and successful. That is the second thing we want to see





#### MONEY IN SHEEP RAISING

Sheep are weed destroyers, soil improvers and yield two crops a year—lambs and wool.



#### KEEPING THE BOYS ON THE FARM

This farmer in Quebec studies and practices progressive farming methods. He thus secures larger profits and, at the same time, retains the interest of his sons.



*illustrated* in a county, not by the Commission of Conservation, but by the people themselves, informed, advised and guided by the Commission. The Commission would stand in about the same relation to the county as it did to the Illustration Farms.

The third field of *illustration* would be in respect to roads and transportation. Could we not get the Dominion, Provincial, county and township authorities to say : Let us centre on this county, not to build the roads for it, but to show how the county could take advantage of existing provisions of all kinds and exert itself until the whole county was equipped with good roads. Meanwhile twenty other counties would want to equal or surpass it.

There are many other benefits that could be obtained through *illustration* of improved education and educational opportunities. Think of what could be done with the rural schools, and rural high schools, and courses of domestic science, stock-judging, field crop competitions, educational farming projects, school fairs, where boys and girls would be brought together in all sorts of wholesome and stimulating ways. By organized effort for desirable ends the community would enrich its social life. It would provide to other counties revelations of attractive rural life. It would *illustrate* how satisfying and profitable farming could become.

The Committee on Lands recommends this plan as the next to be worked out in conservation as applied to the land. It may require to be modified to meet conditions as they are discovered by the survey and county illustrations. But the Committee is of the opinion that it should be undertaken without delay. It is important for Canada, that her people should be employed advantageously on land and that people should live happily and contentedly thereon. The whole nation would find home and foreign trade increased as a result. Its population would be perennially invigorated, financially, physically, mentally, and morally by the practise of the very best farming and the enjoyment of the very best conditions for life in the open country.



# Agricultural Surveys and Illustration Farms

BY

F. C. NUNNICK

*Agriculturist, Commission of Conservation*

## I. AGRICULTURAL SURVEY

**I**N making a survey such as was outlined by the Chairman when reporting on the work of the Committee on Lands, some difficulty is encountered in securing data which are always accurate and reliable. Most of the farmers visited willingly give the information asked for, and represent conditions exactly as they exist. A few speak disparagingly of agricultural conditions in general and are likely to over-state their difficulties, while a few like to create an impression of their superiority and may over-estimate the desirable features found on their farms. On the whole, however, the information obtained represents pretty truly the average conditions found on Canadian farms to-day.

**Ontario a Typical Province** I shall deal largely with the report of the Agricultural Survey in the province of Ontario, which is a fair example of the reports for the whole Dominion.

In the newly settled districts, such as Timiskaming, little attention is being paid to rotation of crops. In the older districts a more or less indefinite rotation is generally followed and usually covers a period of from five to seven years. The past few seasons have been unfavourable to the securing of a good catch of grass seed and this is given as a reason by many farmers why a more definite rotation has not been followed.

**Hoe Crops** In Ontario, so often called the "banner province of the Dominion," we find that 65 per cent of the area occupied by farmers in the districts surveyed was in crops and that only 3 per cent of this was in hoe crops, which would mean that a 21-year rotation would have to be followed on the average, to include the whole farm in hoe crop.

In Prince Edward Island, 67 per cent of the land on the farms visited was in crops, with only 2 per cent in hoe crop.

In Manitoba, 70 per cent of the occupied area visited was in crops and .05 per cent in hoe crops. At this rate, it would take 1,400 years to include the whole farm in hoe crop, that is, putting this amount of hoe crop on a new piece of land each year.

In obtaining information regarding the rotation of crops it may be said that what some farmers consider a systematic rotation is not that which will give best results on the farm, as it does not include a sufficient amount in hoe crops to keep the farm clean or to supply a sufficient amount of succulent feed for the live stock.

In Prince Edward Island the survey work was conducted by a man who lives on the Island and who knows the conditions thoroughly. Among the 100 farmers visited there, only one is reported as following a really systematic rotation. In Nova Scotia there were nine, in New Brunswick 19, while, in Quebec, there were 200 farms visited and the collector states that there was none following a short rotation, and that the plan followed by the average farmer is to leave the land in hay and pasture for from six to eight years, when it would be broken and again seeded to grass and clover. In Ontario, among the 200 farmers visited, there were only eight following a rotation which could be called systematic. In the Prairie Provinces, where grain growing is the first consideration of the farmer, a rotation including grass and hoe crops is almost unknown.

#### **Selection of Seed Grain**

While most of the farmers realize to a certain extent the value of good seed, yet they are lax in their method of securing it even for sowing on their own farms. A great many claim that they save the best portion, or portions, of their fields of grain for seed, yet we have good reason to believe that in many cases their statements are questionable. Even where true, the methods employed are often so unsystematic that by the time of seeding more or less of the poorer grain is mixed with that selected. Up to the present, hand selection of seed seems to be regarded only as an ideal.

In Nova Scotia, only 21 per cent of the farmers visited use seed produced on their own farms. In New Brunswick only 23 per cent use home-grown seed ; in the other provinces, they are doing fairly well in the matter of producing their own seed, but, out of the 1,000 farmers visited in 1914, we found only 19 practising a systematic selection of their seed.

In Nova Scotia, we find only 25 per cent of the farmers making an attempt at cleaning their seed, and in New Brunswick, only 19 per cent clean their grain for seed. In Ontario and the Prairie Provinces, much attention is paid to this matter. Out of 500 farmers visited in Quebec and the Maritime Provinces, we find only three treating their seed grain for smut. While it is difficult to obtain accurate figures regarding the loss from this cause, we know that it

must be very great, and since the treatment is so simple and inexpensive, it is regrettable that more farmers do not treat their seed grain. In the Prairie Provinces, nearly every farmer treats for smut.

**Clover and  
Grass Seeds**

Out of the 1,000 farmers visited this past year, only 87 were found to be producing their own clover seed.

There has been much complaint regarding the difficulty in securing a catch of clover and grass seed during the past few years. In Prince Edward Island, the average amount of clover seed sown per acre is two lbs.; in Quebec, it is three lbs.; while in Nova Scotia, New Brunswick, and Ontario, conditions are better, yet, even in the provinces where the average amount sown is largest, it is found that it is only about half of what should be sown to secure good stands.

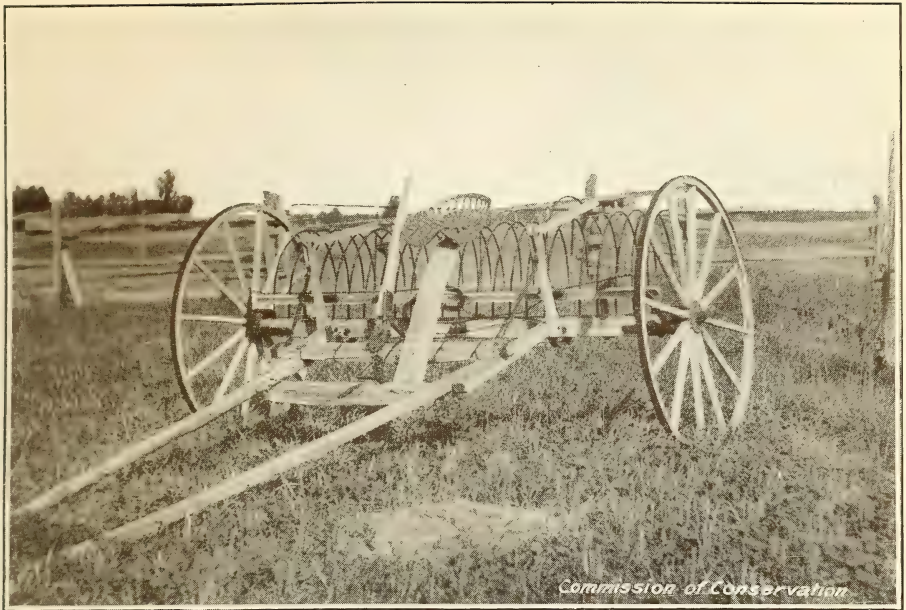
**Clover and  
Live Stock**

During the year 1912, we sent out 200 personal letters to prominent farmers all over Canada, asking their opinion as to how much stock should be kept and how many acres should be seeded to clover each year on the ordinary 100 acres, to ensure permanent soil fertility. Replies were received from 119 of these farmers and the answers were surprisingly uniform. The average numbers given by these men were as follows : Cattle, 24 ; sheep, 23 ; swine, 22 ; acres to be seeded to clover each year, 20. That is, they consider that one-fifth of the farm should be seeded to clover each year. In Ontario and Prince Edward Island we find the farmers doing the best in this regard, as, on the farms we visited, the average number of acres per hundred seeded to clover was 15, while in Nova Scotia, New Brunswick and Quebec, the average amount seeded to clover each year is less than ten per cent, or, in other words, less than half that considered necessary by our correspondents.

Ontario is found to be doing the best in regard to live stock, but, even there, it is found that the amount of stock kept is far below that above mentioned as being necessary. The average on the Ontario farms visited is as follows : Cattle, 14 ; sheep, 10 ; swine, 12. In all the other provinces the average amount of stock found is considerably below that of Ontario with the exception of sheep in Prince Edward Island, where 12 per 100 acres were found on the farms visited.

In the mixed-farming districts, barnyard manure has been used almost exclusively as a fertilizer, although many farmers are, at the present time, contemplating the use of commercial fertilizers. Amongst those who have used the latter, opinions are very diverse





RAKE LEFT TO ROT AND RUST IN THE FIELD WHERE IT WAS LAST USED  
Thousands of dollars are wasted annually on Canadian farms through having implements exposed to the weather at all seasons.



AN IMPLEMENT SHED ON THE FARM IS A GOOD INVESTMENT  
By housing implements when not in use, and keeping them painted and the metal parts oiled, they will last from 25 to 50 per cent longer.



as to their value. This is due to the fact that in most cases they have been used when the farmer had neither knowledge of his soil requirements, nor of the constituents of the fertilizer and their availability.

Ploughing down clovers and other green manures is not practised as extensively as it should be. Where such practice has been followed the results have been very pronounced, and I am thoroughly convinced from my observations that, if more farmers followed the practice, there would be much less cause for complaint at their inability to secure catches of seeds. Where clovers have been ploughed down in seasons that favoured their growth there has been little difficulty in getting a catch of seeds even in the past few dry seasons, and other farm crops have benefited in proportion.

**Control of Noxious Weeds** Many and loud were the complaints of weed seeds in purchased clover and timothy. It was the consensus of opinion that there should be more rigid inspection, but, if the farmers were better trained in the identification of harmful weeds, they would refuse to buy impure seed. Many good farmers are becoming discouraged from the carelessness of their neighbours who seem to view with unconcern the onward march of the sow thistle and other noxious weeds.

Greater scientific knowledge is much needed in combating weed and insect pests. The army worm, which did so much damage throughout Ontario during the past season, had been looked upon by most farmers as a pest not belonging to this country at all, consequently, many of them were in despair not knowing what measures to adopt to control it, and, in many cases, much greater loss would have resulted but for the timely aid of the district representatives of the Department of Agriculture. The annual loss from smuts and rusts of grain and from other diseases and insect pests is enormous, and could be greatly lessened if the farmers only knew that many of them would yield to simple treatments. Many of the worst weeds are getting ahead of the farmers and, unless methods of control are put into practice at once, the weeds will gain the upper hand.

In 1910, 100 farms were visited in each of the Prairie Provinces and, on 100 per cent of the Manitoba farms, wild oats were found. In Saskatchewan, 71 per cent, and in Alberta, 3 per cent reported wild oats. In 1911, on the same farms in Alberta, 31 per cent reported wild oats, while, in 1912, a still larger number reported this weed, showing that it was travelling westward with a vengeance. In the districts visited in 1913, wild oats were reported by 83 per cent of the farmers.



The following table shows how some of the worst weeds are increasing. These figures are taken from the results of the Agricultural Survey of 1914 :

WEED	MANITOBA		SASKATCHEWAN		ALBERTA	
	Per cent reported	Per cent increasing	Per cent reported	Per cent increasing	Per cent reported	Per cent increasing
Ball mustard....	59	24	55	52	91	7
Canada thistle...	95	91	26	21	38	12
Sow thistle. ....	44	33	3	3	..	..
Stinkweed.....	41	8	69	61	68	6
Wild oats.....	95	80	59	56	83	13

WEED	NOVA SCOTIA		P. E. ISLAND		NEW BRUNSWICK	
	Per cent reported	Per cent increasing	Per cent reported	Per cent increasing	Per cent reported	Per cent increasing
Couch grass. ....	84	17	39	2	93	32
Ox-eye daisy.....	92	14	73	24	93	21
Sow thistle. ....	3	1	34	18	..	..

WEED	QUEBEC		ONTARIO		AVERAGE FOR EASTERN CANADA	
	Per cent reported	Per cent increasing	Per cent reported	Per cent increasing	Per cent reported	Per cent increasing
Couch grass.....	96	82	53	12	73	29
Ox-eye daisy.....	69	51	34	7	72.2	23.4
Sow thistle.....	68	17	63	12	33.6	9.6

### Live Stock Conditions

Live stock conditions vary greatly with the district, but, as a rule, the newer the district the poorer the conditions. The presence of a few first-class breeders in a district usually has an influence upon the entire stock of the district as a result of the service of their males. Too many farmers, however, fail to realize that the male is half of the herd, and a few dollars or even a few cents is, too often, sufficient to induce them to use an inferior male.

The careful crossing of breeds of certain classes of live stock sometimes gives good results, but the careless crossing, which is all too common a practice, has given rise to many flocks and herds of decidedly mongrel appearance.

Individual dairy records are rarely kept and the farmer, as a rule, has little idea which animal is an asset to his herd and which is a detriment.

**Fuel and Power  
Conditions**

Little attention has been paid to reforestation and, in many sections, the wood supply is nearly exhausted. The farmers, however, prefer to depend upon substitutes, rather than plant trees, the benefit of which will only be received by the generation to follow.

The gasoline engine is rapidly becoming popular, as a source of power, but has not yet been utilized for field work. The bulk of the work still falls to horse and man.

**Labour Saving  
Devices**

The complaint of shortage of farm labour is very general, and that which is available is often very unsatisfactory. It is claimed by a few that the farmers themselves are to blame, and that, if more patience were exercised in training the men, satisfactory results would be obtained. This, however, is contradicted by the majority.

Hot and cold water on tap and sewerage systems are very uncommon, as yet, in country houses. Great waste of labour results from the lack of handy appliances in the houses, and in the barns and stables. In some cases, lack of capital is responsible for the absence of these conveniences, and, in other cases, lack of aggressiveness is the cause.

**Book-keeping  
and Literature**

Few farmers keep even the simplest form of farm accounts, and most of the answers to questions put to them are merely estimates. They cannot say definitely what branch of their work is yielding the best returns. In the few cases where farm accounts are being kept, a greater interest in the work is stimulated and is usually associated with greater success.

The value of good and instructive literature is not sufficiently appreciated, and many of the bulletins mailed to the farmers are thrown into the scrap heap unread. Others who desire information along specific lines do not know that, in many cases, such information can be secured merely for the asking. Still others are incapable of fully understanding the information contained in bulletins and other publications. What is most needed are leaders in the different communities, and along this line the District Representatives are supplying a much felt want.

The work now being done in the rural schools is having a very beneficial effect, and the farmers are learning, through the experimental plots of their children, the value of seed and variety selection.

The value of under-drainage is now beginning to be realized by many farmers and the increasing number of applications for complete surveys indicate that much of the land now under cultivation will be improved and other waste areas will be reclaimed.

In conclusion, I would say that, in many cases where conditions are unsatisfactory, it is due to the lack of knowledge on the part of the farmer rather than the lack of interest. That the farmers were eager for information was evident from the many questions asked by them.

## II. ILLUSTRATION FARMS

The work conducted on the Illustration Farms has included the following :

1. The planning, commencing and carrying on of a suitable systematic rotation of crops for the farms and their neighbourhood.

On a number of the farms in Ontario, Quebec and the Maritime Provinces, definite rotations were being followed. On some of the farms, however, the plan has been improved to make the rotation more definite and systematic, so that the whole farm will be included.

### Nature of Work on the Prairies

In the Prairie Provinces, where grain-growing is largely followed, more difficulty is experienced in getting the farmer to adopt a rotation which will include grasses and clover. On one of the Illustration Farms in Saskatchewan, the farmer has divided his half-section into six 50-acre fields, leaving 20 acres for minor crops and paddocks around the house and barn. One of the 50-acre fields was this year seeded to grass and clover with the expectation of adopting on the whole farm the six-year definite rotation which has given the best success at the Dominion Experimental Farm at Indian Head.

On another farm in Alberta, 50 acres were sown to grass and clover this year with the expectation of practising a rotation, including more grass and hay than have formerly been grown. This farmer is also planning to keep more live stock and carry on mixed farming and has already erected some buildings for this purpose.

2. The sowing of the varieties and strains of grain suitable to the farm and the district.

On some of the farms grains were being sown, the names of which were unknown by the farmers. On the Illustration Farm at St. Charles de Bellechasse, in Quebec, an old, unknown variety of white oats was being grown. The Commission introduced registered seed of the Banner variety with the result that, the first year, an increase in the yield of from ten to twelve bushels per acre was given. Similar results were obtained on several other farms in the province of Quebec.

In Lanark county, in Ontario, the farmer conducting illustration work for the Commission is now growing registered Banner oats.





#### UNDESIRABLE MARKET WAGGON

Produce cannot be displayed attractively in a dilapidated waggon.



#### UP-TO-DATE MARKET WAGGON

In such a waggon vegetables can be kept cool and clean and shown to advantage on the market. This results in ready sales and larger returns.



This year he has over 300 bushels to sell. He has already sold 140 bushels for seed at \$1.00 per bushel, being at least twice as much as he received for his oats which he sold formerly at feed prices. This man is highly pleased with the monetary results he has obtained.

3. Different rates per acre to ascertain the most suitable rate of seeding.

The right amount of grain to sow per acre varies largely with the local conditions. In the Maritime Provinces, it was found that many farmers were sowing as high as five bushels, or more, oats per acre. Tests have been conducted to ascertain the most suitable amount. Where good seed is being sown and where it has been well cleaned, it has been found that in many cases the farmers have been sowing altogether too much.

The following paragraph from the report of the work done on the Illustration Farm in Carleton county, N.B., may be of interest :

“We sowed two acres of oats to each of the following seedings : one and one-half bushels, two and one-half bushels, and three bushels per acre. The portion of the plot which was in fine condition and which was sown at the rate of one and one-half bushels per acre was much superior to the seeding of three bushels per acre. This was all in one field, but, where the soil was in average condition, the two and one-half bushels per acre gave the best yield. In the adjoining field we sowed Banner oats at the rate of two and one-half bushels and three bushels per acre, the lighter seeding being the better in this field.”

Several points are often overlooked by the farmers in regard to the thickness of seeding. One point is the cleaning of the grain, and another, the condition of the soil. If the grain is well cleaned and the soil in good condition, a smaller amount of seed to the acre is sufficient. These are points which have been impressed upon the farmers conducting illustration work, and which are receiving attention by them.

4. The sowing of different amounts per acre of clover and grass seed to ascertain the most suitable rate of seeding of both home-grown and purchased seed.

One farmer in Ontario writes as follows :

“Until the visits of the Commission's travelling instructor, we had not been sowing a sufficient amount of clover seed per acre to ensure a good catch. Another point brought out in these demonstrations, and one which cannot be too strongly emphasized, is that one pound of home-grown clover seed is worth much more than a pound of seed grown elsewhere.”



Last year, 14 bushels of choice clover seed were grown on this farm, this being the first clover seed grown by him.

On the Illustration Farm in Lanark county, 1,200 lbs. of choice clover seed were produced in 1914, being the first that this farmer has ever grown. This seed at 22 cents per pound would be worth \$264. Surely that is worth while. Had the second crop of clover been pastured, as is the usual practice, it would not have been worth \$64. On at least six neighbouring farms, clover seed was harvested in the same year, solely as a result of the work conducted on our Illustration Farm.

#### 5. The sowing of various summer pasture mixtures.

In many districts the question of pasture for the cattle during the summer and dry season is an important one. The Commission has introduced the sowing of mixtures for the purpose of giving pasture to the cattle during the dry season of the year. The following is taken from the report of one of the men conducting illustration work in Waterloo county :

"Two acres of sod were ploughed in the fall of the year 1913, and, in June, 1914, seeded with oats, three bushels ; peas, one bushel, and clover, ten pounds per acre. This mixture made a remarkable growth and gave a fine pasture for the cattle during July and August when the other pastures were suffering from the dry weather."

The following is from the report of one of our farmers from Antigonish county, N.S. :

"The summer pasture mixture gave a splendid crop of feed, of which the cows were very fond. We would let them eat it down and then take them off for a couple of weeks, when it would be grown up ready for them to eat off again."

Another farmer in Pictou states that four acres were sown with oats and vetches. On two acres the cows were allowed to pasture, which increased the amount of milk, while the other two acres were cut green and fed to the cows in the stable. Both methods gave good results.

#### 6. The practising of after-harvest cultivation, extra and more thorough cultivation to kill weeds, conserve moisture and increase yields.

In many districts visited by the Commission, weeds have been very prevalent on the farms and poor yields have resulted from insufficient and careless cultivation. The Commission has introduced on many of the Illustration Farms the practice of after-harvest

cultivation. Splendid results have been obtained from the cultivation illustrations. The following is what one Ontario farmer has to say about it :

“The benefits of the after-harvest cultivation conducted previous to last year's crop were quite evident in this year's crop. Not only did it more than pay for itself last year, but this year, the oats and barley on the plots that had been cultivated after harvest two years ago, were heavier and freer from weeds than that on the adjoining plots that had not received the extra cultivation.”

Another farmer in Nova Scotia writes as follows :

“The wheat on the corn ground, and where it received the extra cultivation, yielded 21 bushels of wheat per acre. Where the land was only ploughed once in the autumn, the yield was ten bushels per acre ; the difference probably was greater on account of the dry season this year. Cost of extra cultivation, four dollars per acre, value of extra grain crop eleven dollars, being eleven bushels at one dollar per bushel, making a profit of seven dollars per acre. Besides this, the grass and clover seed had a very much better start on that part of the field where the extra cultivation was carried on.”

#### 7. The introduction of labour-saving devices and up-to-date machinery.

On the majority of farms little attention is paid to the conserving of time and energy in the conducting of the farm work. Farmers often send to the fields two two-horse outfits which require two men to operate them, when one man could drive the four horses and plough two furrows as well as one, or could join the two sets of harrows and perform the work which formerly required two men. On one of the farms, by thus combining the implements, one lad drove four horses hitched to the roller, behind which were attached the harrows, and in this way covered 22 acres in one day, performing at one time the two operations of rolling and harrowing. As a result of the advice of the travelling instructor, on many of the farms are to be found to-day, harrows covering from 15 to 20 feet, where formerly harrows covering only from 8 to 10 feet had been used. Of course, more horse-power is required to accomplish this, but not more man-power. On many of the farms, upon the advice of the instructor, new implements have been purchased by the farmer, which are labour-saving and much more suitable than the old-fashioned implements formerly used.

#### 8. The care, and economical use of farm-yard manure.

On almost every farm visited it has been found that a great amount of waste is going on regarding farm-yard manure. Illustrations have been conducted on many of the farms in the different

methods of application, such as : (1) manuring during winter, the manure being spread directly from the sleigh and being put out in small piles, ready for spreading in the spring ; (2) ploughing the manure under in the springtime, and using it as a top-dressing after ploughing, and also as a top-dressing on the newly seeded meadows immediately after the grain is taken off. The farmer's attention has been drawn in all cases to the necessity of conserving the liquid manure by the use of absorbents of various kinds. The full value of the liquid manure is seldom realized by the farmer and he too often neglects to adopt methods for saving and applying it to the land. These points have been strongly emphasized on every farm. Results on many of the farms have shown that it is more economical to apply manure in the green state, rather than to allow the fertilizing constituents to be lost by overheating and leaching.

#### 9. The encouragement of a farm garden.

On most farms in Canada, the garden receives very little consideration, the farmer not realizing the importance and value of a supply of fresh vegetables during the summer season. When the Commission began work with the Illustration Farms, one of the first things undertaken was the encouraging and starting of a vegetable garden on each farm. On one farm in Prince Edward Island, the housewife kept a large flock of chickens and, consequently, thought that a garden was out of the question, but the Commission's travelling instructors planned with the farmer to have the vegetable garden in the field with the corn and roots. This worked out very well, as the garden could be cultivated in a very short time with the horse cultivator, whenever the roots or corn were being attended to. This plan has since been adopted on a number of the other farms. On many of the farms, splendid supplies of fresh garden stuff are now grown regularly for the table, where formerly the supply was incomplete and insufficient. Flowers are also being grown by the children and women in the home, which go a long way toward making the home more attractive and pleasant.

10. Directly and indirectly encouraging many other means to make the farm more profitable, the farm life more satisfactory and pleasant, and to conserve for the country, the young people on the farms.

#### General Conclusions

This work has been intensely interesting, and the manner in which the farmers have undertaken and so successfully carried on the work outlined is indeed gratifying. Another feature which must not be overlooked has been



the interest aroused among the young people in the great possibilities of the old home farm when scientific and up-to-date methods are adopted. On one of the Illustration Farms, among the French-speaking farmers of Quebec, the farmer and his six grown-up sons would drop all work to accompany the instructor each time he visited the farm, all joining in the discussions and asking questions relating to the farm operations. This farmer himself stated that, since adopting the advice of the Commission's instructors he had, in 1914, the first successful crops of clover and of corn he had ever grown on his farm.

### III. ALFALFA DEMONSTRATION PLOTS IN QUEBEC, 1914

In former years, Prof. L. S. Klinck, of Macdonald College, conducted the alfalfa experiments in Quebec, for the Commission; during the year, however, he severed his connection with the college. As a result, Prof. R. Summerby, Lecturer in Cereal Husbandry at Macdonald College, inspected the plots in 1914. Prof. Summerby's report follows :

"Practically all alfalfa and clover in this province came through the winter of 1913-1914 in a seriously weakened condition due to the late winter and early spring frosts. This, followed by a severe drought lasting until late midsummer, made the conditions for the growth of these crops the worst that we have had in recent years. This is also evidenced by the low yield of hay in the province.

"Two fields were under test in this section in 1914. One of these did not come through the winter with a sufficient stand to warrant being left for hay and, consequently, it was ploughed up. Judging from the condition of the plants as they entered the winter, and, as this field behaved very similarly two years ago, it is probable that soil conditions were partly, if not largely, responsible for the loss of crop. The other field in this section came through the winter in a weakened condition, but with a complete stand, and soon recovered its vigour. Three excellent cuttings were obtained, each of which would surpass the average yield of hay in the vicinity. The owner of this block of alfalfa is so well satisfied that he intends to put in a much larger acreage next year, and is even contemplating sowing some in rows for seed.

#### L'Assomption County

"By far the greatest success has been had in this county as compared with others so far tried. Of three fields originally set out all were sufficiently good to out-yield other hay crops of the vicinity. Three good cuts

#### Huntingdon County

were obtained from two of these fields and two were taken from the remaining one. There is no doubt but that alfalfa can be grown in this section of the province without any difficulty providing that drainage and good cultural conditions are given.

**Brome  
County**

"In this county three fields were originally set out with this work. On all these the growth of sheep sorrel, sour grass and other plants that indicate acidity, were quite abundant, in spite of the fact that an application of lime was given at the time of seeding. It seems probable that a further application will be necessary for the most successful alfalfa culture. Two of these fields produced very little growth and were ploughed up after the first cutting. The third field, however, gave a high yield from the first cutting as compared with other hay crops, and also gave a good second growth in spite of the extraordinarily dry conditions prevailing at that time. On account of the prevalence of the above mentioned weeds, however, it was considered wise to plough it and prepare for re-seeding.

"Work on one of the first mentioned fields has been discontinued as it has an extremely open and loose subsoil. The other two are being prepared for re-seeding in 1915, when a further application of lime will be given with the hope of rendering them fit for producing alfalfa quite successfully."

During the winter and early spring of 1914, meetings were held in the districts where the Illustration Farms had been selected. At these meetings addresses were delivered by the representatives of the Commission on various agricultural topics. The addresses were illustrated by lantern slides, made from photographs of actual operations on the farms, in connection with soil cultivation, farm crops, care and uses of manures, and the use of machinery on the farm. Many requests have come in from other places for speakers, and, whenever possible, they have been provided.

During the year the agriculturist has written articles each month for *Conservation* and four special press bulletins on the following subjects :

- The Army Worm and Methods of Control
- Increasing Grain Production
- Increasing Live Stock Production
- Farm Machinery, its Care and Abuse.

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The Commission adjourned for recess.

## Reports of Committees—Resolutions

THE Commission reassembled at three o'clock on Wednesday afternoon, January 20, to receive the reports of Committees. At the request of Sir Clifford Sifton, Mr. Snowball took the chair.

THE CHAIRMAN : We shall first have the report of the Committee on Lands by Dr. J. W. Robertson.

### COMMITTEE ON LANDS

DR. ROBERTSON : The Committee on Lands begs to report :

That a two years' survey has been completed on the second groups of farms (about 1,000 farms) selected for that purpose in 1913 ;

That investigations through the Illustration Farms of the Commission have been conducted during the second year ;

That the information obtained from the surveys and from the Illustration Farms, controlled and managed by the farmers themselves, has been of great service and value in indicating how all the many agencies (local, Provincial and Dominion), which are working for the improvement of farming methods, and the betterment of rural conditions, can most advantageously accomplish their objects ;

That the surveys and investigations have revealed the serious nature of some of the difficulties in the way of securing an adequate supply of competent labour on the farms ;

That in consequence, the Committee on Lands recommends that it be authorized and directed to seek the co-operation of local, Provincial and Dominion bodies and authorities in instituting and conducting a survey of rural conditions, farming methods and systems of agriculture in one or more areas each of about a county in extent, for the purpose of obtaining further information and of shedding light upon such problems as :

1. Those of an adequate supply of competent labour for agricultural and cognate work ;

2. Those of effective co-operation in carrying on work and in marketing ;

3. Those of good roads and transportation ;

4. Those of the betterment of rural conditions generally, all to the end that rural life and work may become still more attractive, profitable and satisfying to a larger proportion of our population.

On motion of Dr. Robertson, seconded by Dr. Bryce, the report was adopted.



## COMMITTEE ON MINERALS

DR. ADAMS : I desire to submit the following report for the Committee on Minerals :

1. That with a view to the prevention of waste in coal mines operated under Dominion leases, the Committee strongly recommends that the Dominion Government appoint a person having a wide experience and thorough knowledge of coal mining, as Chief Inspector of Mines, to whom, in consultation with the Provincial Inspectors of Mines all plans for the development of the leases in question shall be regularly submitted and whose approval of the same must be secured before the actual work of mining is begun.

2. The Committee recommends that there be added under Section 29 of the Regulations for the Disposal of Petroleum and Natural Gas Rights the following provisions :

(1) Within a specified time after the completion of any bore-hole, a statement concerning the exact location of the same together with a log of the boring shall be filed with the Government.

(2) That every gas well when abandoned, or when the gas from it is being no longer used, shall be properly plugged.

The Committee also desires to point out that experience everywhere has shown that the life of any gas field is limited to a relatively short term of years, and that if the gas is wasted this productive period is shortened. No waste of gas of any kind, therefore, should be permitted.

3. The Committee is of the opinion that an investigation into the possibility of abating the smoke nuisance in Canada should now be undertaken.

On motion of Dr. Adams, seconded by Dr. Fernow, the report was adopted.

## COMMITTEE ON FISHERIES, GAME AND FUR-BEARING ANIMALS

DR. JONES : Mr. Chairman, there are only three members of the Committee on Fisheries present at this meeting. We had no formal Committee meeting, but we had some informal discussions amongst ourselves. We decided that there was no necessity for bringing in a written report, but that I should give a word of explanation as to the activities of the Committee during the year. The Chairman of the Commission in his opening address gave a review of the work of the Committee—quite a complete review.

In the matter of publications the Committee was not so active last year as in some preceding years, the only publications issued under the name of the Committee being a second edition of the report on "Fur-Farming in Canada." This was almost a new report and created a great deal of interest and won very wide demand. There is that at least to be said concerning reports.

Some members of the Committee were impressed with the thought that much more could be done than has been done in the way of instructing fishermen in the proper care of their catches and in the proper methods of packing and shipping. In some correspondence with Mr. Donnell of the editorial staff, I thought that something might be done in the way of investigation along that line by members of the staff, and the paper on "The Fresh Sea Fish Trade," which was read at this morning's meeting, is the outcome of that correspondence.

We wish to recall the fact that three years ago the Committee on Fisheries had a meeting in Ottawa, at which resolutions were passed in favour of government inspection of packages of fish and of official branding of packages. It was hoped in this way to standardize the parcels and packages in which fish would be shipped and thus give a better status to the trade. I would point out that the resolutions passed at that meeting, after conference with the Federal Department of Fisheries, and which have been reiterated at successive meetings of the Commission, have at last found expression in an Act passed by the Dominion Parliament. *The Fish Inspection Act of 1914* has some admitted faults, still it is a step in advance, and I feel that the Committee has been instrumental, to some extent at least, in bringing about the improved condition in that respect.

We have also carried on during the last month or two in *Conservation*, the official publication of the Commission, a campaign designed to teach people the value of fresh fish as food. It is thought that now when food products are less plentiful that perhaps the supply of cheap fresh fish, especially on the Atlantic coast, might lend itself to purposes of food, not only in the coast centres, but throughout the country. That campaign is still in progress in a small way.

The Committee wishes to ask the Commission informally to continue to endorse its suggestion that an expert be provided to carry on research work and to advise the Committee in connection with its work. It was the intention that an expert should be appointed last year, but just when the matter was being brought to a head, the war broke out. As a result the expert was not engaged, and it is as well that he was not, just at that time. I wish, however,

to refer to the fact again, that the feeling of the Committee is that such a man would be invaluable and that it is difficult to get along without him. When conditions are improved somewhat—perhaps during the summer of 1916—the appointment may be made. We simply wish to call attention to the fact again so that the matter may not be allowed to go by default, but that the services of an expert be secured when a suitable opportunity offers. Our activities have not been quite as prominent as usual during the past year and during the present session, but we hope to improve our position a little very soon.

THE CHAIRMAN (Mr. Snowball) : I might suggest that there is a vacancy on the Committee on Forests through the lamented death of Mr. Frank Davison, whom you will remember as being very faithful in his attendance at the meetings of the Commission. Mr. Davison took an active interest in all matters of this kind. He was not only a successful lumberman, but he was an educated man with whom we all felt it a pleasure to be associated, and his loss to the province of Nova Scotia and the Committee on Forests is a serious one.

DR. FERNOW : Might I at once respond by moving that Dr. Adams be added to the Committee on Forests in the place of the late Mr. Davison ? His interest in the subject is well known ; in fact, his own profession is somewhat related to forestry and I believe he would be an excellent substitute for Mr. Davison.

Motion agreed to.

#### COMMITTEE ON FORESTS

DR. FERNOW : The Committee on Forests submits the following suggestions :

1. The taking of the inventory of forest resources of British Columbia, now well under way, should be continued until completed. The similar work in Saskatchewan, now discontinued for lack of funds, should be again taken up at the first opportunity. Similar studies should be started in other provinces as rapidly as funds will permit.

2. In connection with the investigation of forest resources of British Columbia, the Commission should recognize the exceedingly valuable co-operation afforded by the British Columbia Forest Branch, the Canadian Pacific railway, the Dominion Forestry Branch, and the large number of limit-holders and other individuals who have supplied detailed information. As to the work in Saskatchewan, the same acknowledgment should be made to the Dominion Forestry Branch and a large number of limit-holders and other individuals.



3. The Board of Railway Commissioners should be congratulated upon the beneficial results arising from its efforts towards better fire protection along railway lines.

4. The Governments of Nova Scotia and New Brunswick should be urged to make early provision for the appointment of provincial foresters.

5. Further representations should be made to the Dominion Government concerning fire protection along the Government railways. Attention is particularly needed along the International Railway of New Brunswick, in connection with right-of-way clearing and the establishment of special patrols. The Government railways should be made subject to the fire protection requirements of the Board of Railway Commissioners.

6. Representations should be made to the Dominion and Provincial Governments, urging that a systematic beginning be made at reduction of the fire hazard along railway lines, by the removal of inflammable *débris* on a narrow strip adjacent to railway rights-of-way through forested sections. So far as lands in private ownership are concerned, legislation will be necessary in some cases, while in others the more thorough enforcement of existing provisions will be sufficient. The same is true as to Crown lands under license. To cover the situation on unlicensed Crown lands, the expenditure of money by the respective Governments will be necessary. The more dangerous sections through forest reserves and parks should receive first attention.

7. The action already taken by the Dominion Government in the establishment and extension of forest reserves is to be commended. This policy should be continued as rapidly as the necessary land classification can be completed, and sufficient funds should be made available to provide for protection and administration.

8. The action most urgently needed at the present time, to increase the efficiency of the administration of Dominion forest reserves, is the extension of Civil Service regulations to include the field staff of the Forestry Branch, with provision for annual examinations of a thoroughly practical character, and the appointment of only those men who may reach the required standard. Similar action is also urgently needed in the field services of the various provincial forestry and fire protective organizations.

9. The attention of the Dominion Government should again be called to the urgent need for such a change in organization as will

result in the adequate enforcement of cutting regulations on licensed timber berths, with a view to securing better forest reproduction and a greater reduction of the fire hazard.

10. The Ontario Government should be urged to make further extensions of the forest reserve area, with a view to placing under protection and administration the better classes of forest growth on non-agricultural lands, not at present included in forest reserves and parks. Such action as to the best stands of young growth is particularly desirable.

11. A further attempt should be made to interest the Dominion Government and the provincial authorities of Ontario in the adoption of some co-operative arrangement looking toward the protection and restoration of the Crown lands of the Trent watershed. It is suggested that these lands be turned over to the Dominion Forestry Branch for this purpose, under some arrangement acceptable to the Ontario Government.

12. Further representations should be made to the Government of British Columbia, favouring the establishment of a game preserve on the headwaters of the Flathead river, adjoining the Glacier National park in Montana and the Waterton Lakes park in Alberta.

13. The Dominion Government should be urged to make suitable provision for the establishment of a section of Forest Investigations in the Dominion Forestry Branch, such section to be charged with the conduct of scientific studies in the field calculated to furnish a permanent basis for Canadian forestry practice.

On the motion of Dr. Fernow, seconded by Dr. Robertson, the report was adopted.

#### COMMITTEE ON WATERS AND WATER-POWERS

DR. BRYCE : I beg leave to submit the following report :

When the Committee on Waters and Water-Powers met they were very conscious of the absence of their Chairman, Hon. H. S. Béland, who, after so nobly placing his services at the disposition of the Belgians, is now, we understand, a prisoner of war at Antwerp. Dr. Béland has always shown the greatest interest in the work connected with waters and water-powers, and also in his efforts on the Committee.

The hope was expressed at our meeting that he would at least be able to be present at the next annual gathering.

The Committee on Waters and Water-Powers desires to report that throughout the year the work of the officers of the Commission

connected with the water investigations has been especially heavy, as a number of unlooked for special problems have arisen which demanded attention. It may be remarked that the larger individual problems with which the water engineers of the Commission have had to deal, and upon which their efforts have mainly been occupied, have extended over two or three years, and sometimes over even a longer period.

Last year, the recommendations made by the Committee included the assemblage of all existing data that may be in the possession of the Dominion, or the Provincial Governments, or even with corporations or individuals, relating to the waters of Canada ; also the study of problems connected with the Great Lakes system, including the St. Lawrence route ; and also Canada's important interests in boundary waters. It has not been possible during the past year to do more than make a small start towards the carrying forward of some of these recommendations. The Committee, therefore, desires to re-endorse their recommendations of last year, which are as follows:

1. That all possible information respecting the waters in Canada, connected directly or indirectly with boundary waters, should be collected and digested.

2. That the investigation of the St. Lawrence, undertaken with reference to the Long Sault rapids, should be extended to cover the whole river between slack water at Prescott and Montreal.

3. That, as accurate data respecting the flow of streams is absolutely necessary in developing water-powers, all existing information respecting gauge readings, measurements of stream flow and other cognate data in the possession of the Dominion Government, the Provincial Governments, corporations and individuals should be collated and published.

There will be a large amount of effort required in order to satisfactorily complete the work outlined, and we believe it is desirable that the recommendations should stand until satisfactorily disposed of.

The Committee on Waters and Water-Powers has been much gratified in noticing the progress which is being made in connection with the investigation of waters, especially in the more westerly provinces, where the work has been taken up energetically during the last two or three years. The Committee has been informed that the Provincial Government has appointed a commission to deal with the waters of Nova Scotia, and has made appropriation for assisting the work. The province is seeking some assistance by way of guidance



and otherwise from the Dominion Government, and the Committee believes that no difficulty should be experienced on the part of the province in securing any reasonable co-operation which they desire.

We understand that the province of New Brunswick is also moving along similar lines, a course which is much to be commended in the interests of all concerned.

On the motion of Dr. Bryce, seconded by Dr. Jones, the report was adopted.

#### COMMITTEE ON PRESS AND CO-OPERATING ORGANIZATIONS

DR. BRYCE : On behalf of the Committee on Press and Co-operating Organizations, I beg leave to submit the following report :

The Committee recommends the extension of publicity work to take in the school teachers of Canada who are working among children of twelve years and over. While this would mean a large increase in the circulation of *Conservation*, the Commission's monthly publication, it is felt that, if lasting results are to be obtained, every opportunity must be taken to instruct and interest the rising generation in the work of conservation. How this publicity would be undertaken is a matter of detail, but precautions could be taken to provide against waste of circulation.

The Committee further recommends the extension of publicity work by the preparation of a number of ready-made lectures on conservation subjects. These would be illustrated by circulation among the audiences, of illustrations relating to the subject, similar to those now appearing in our reports. The idea is to supply these lectures to school principals, officers of associations and others requesting their use. The Departments of Education of the several provinces could be asked to assist by receiving applications for the use of lectures.

The supplying of lectures and lantern slides, illustrating conservation, to the extension departments of the universities and agricultural colleges is also advised.

The Committee also recommends a continuance of the publicity work as already being carried out.

On the motion of Dr. Bryce, seconded by Dr. Rutherford, the report was adopted.

#### COMMITTEE ON PUBLIC HEALTH

DR. JONES : Mr. Chairman, I am the only member of the Committee on Public Health at this annual meeting. I wish to make one or two informal remarks and attempt one or two resolutions. In the first place, I desire to express approval of the work

done by Dr. Hodgetts, Medical Adviser of the Commission, and also the work done by Mr. Adams, who is the Town Planning Adviser of the Commission. Both these gentlemen have rendered very great services to the Commission during the past year. Personally, I am more familiar with the work of Dr. Hodgetts and I am convinced that Dr. Hodgetts has given the Commission very hearty service, and service that has done very much good to the country, as well as being very much to his own credit. If I might be permitted to move in this informal way, I move that the Commission express its approval of the work of these gentlemen.

DR. ROBERTSON : I have pleasure in associating myself with this resolution. The Chairman in his address made a gratifying and proper reference to Dr. Hodgetts and the reason for his absence. I happen to know that he is doing uncommonly good work for the Red Cross Society in Great Britain. Only last week the society had cable correspondence with him and one result was that the Ottawa Branch cabled him to buy two more motors for the Canadian hospital. The society also sent last week 781 packages of medical supplies for the Canadian contingent. So, if in any way we can hold up his hand, and strengthen his position by conveying to him our expression of appreciation of his good work for the Commission and the good work he is doing now, we should do so.

Motion agreed to.

DR. C. C. JONES : Mr. Chairman, you will remember that last year we had the pleasure of the advice of Lieut.-Col. J. H. Burland, who gave us very marked service in connection with our meeting and in connection with other meetings throughout the year. So I should like to move that this Commission express to the family of Lieut.-Col. Burland, its deep sympathy in his death.

DR. ADAMS : I should be very glad to second that motion. I knew Lieut.-Col. Burland very well from the time he was a schoolboy until his death. There were few people, men of wealth and leisure, in Montreal or elsewhere, who took a more direct interest in the matters pertaining to the public good and welfare than Lieut.-Col. Burland. We shall miss him very much indeed, not only in Montreal, but on the Commission and everywhere in Canada.

THE CHAIRMAN (Mr. Snowball) : I am sure that most hearty sympathy will be expressed by all here. We appreciate the work which Lieut.-Col. Burland did and the interest he took in all social questions. He did important work in connection with the Com-

mission, as well as in connection with other important works. I am sure that the Commission will wish to have this resolution expressed to the family in the most sympathetic way.

The motion was carried.

SIR CLIFFORD SIFTON : That concludes our session. All I have now to say is to thank you for your attendance here and to hope that you have, as I have, found this annual meeting the best and the most interesting we ever have had. When this Commission was inaugurated, some friends of mine in talking the matter over with me, expressed the fear that we would not be able to keep up the enthusiasm ; that it would be likely to start off with a good deal of zest, but that the desire for improvement would probably die out considerably and we would find it difficult to keep up steam. But, on the contrary, I think we have a right to feel that we are progressing satisfactorily, and that we have managed to keep up the motive power and the interest in the proceedings without very much difficulty. For my part, when I look back on what has been accomplished during the last four or five years, I am sure that we have a right to feel that we can thank God and go on with hope for the future.

I thank you for your attendance and hope that we shall have a useful and profitable year ahead of us.

The Commission adjourned.

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# Appendix I

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## National Conference on City Planning

Held in Toronto, May, 1914

**D**URING the autumn of 1913, the Commission of Conservation, in conjunction with several prominent Canadians, commenced a movement to secure for Canada the sixth annual meeting of the National Conference on City Planning. The approval and assistance of the Dominion Government was obtained, a special appropriation of \$7,500 being placed in the estimates to defray the expenses of the meeting, and the Commission was also requested by the Prime Minister to act as host.

The official invitation extended to the National Conference was accepted and the meeting convened in the city of Toronto May 25, 1914. The sessions, which covered three days, were held in Convocation Hall, University of Toronto, and were formally opened by H.R.H. the Duke of Connaught, Governor-General of Canada. Addresses were given as follows :\*

*Address of Welcome*—H.R.H. THE DUKE OF CONNAUGHT

*Response*—HON. GEORGE McANENY, New York City

*Address of Welcome*—SIR CLIFFORD SIFTON, Ottawa

*Response*—FREDERICK LAW OL MSTED, Brookline, Mass.

*Greetings from the Town Planning Institute of Great Britain*—  
THOMAS ADAMS, London, Eng.†

*Basic Principles of Water Front Development as Illustrated by the  
Plans of the Toronto Harbour Commissioners*—ROBERT S.  
GOURLAY, Toronto

*Certain Aspects of City Financing and City Planning*—ANDREW  
WRIGHT CRAWFORD, Philadelphia

*Progress of the Year in City Planning*—FLAVEL SHURTLEFF, Bos-  
ton

*Protecting Residential Districts* — LAWRENCE VEILLER, New  
York City

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\*The proceedings have been printed and copies may be obtained from Mr. Flavel Shurtleff, Secretary of the National City Planning Conference, 19 Congress Street, Boston, Mass. The volumes are of 361 pages, neatly bound in cloth, and are being sold at \$2.00 each.

†Mr. Adams is now Town Planning Adviser to the Commission of Conservation.

*Constitutionality of Districting Legislation*—ALFRED BETTMAN, Cincinnati

*German Districting*—FRANK B. WILLIAMS, New York City

*A Town Planning Act for Canada*—LIEUT.-COL. J. H. BURLAND, Montreal

*Draft of Proposed Canadian Town Planning Act*

*Experience under the English Town Planning Act*—THOMAS ADAMS

*Canada and the United States as a Field for the Garden City Movement*—G. TRAFFORD HEWITT, London, Eng.

*Provision for Future Rapid Transit*—J. V. DAVIES, New York City

*Utility of the Motor Bus and Municipal Problems Pertaining to Its Operation*—JOHN A. MCCOLLUM, New York City

*The New York Rapid Transit Problem*—HON. GEORGE MCANENY, New York City

*Size and Distribution of Playgrounds*—PROF. HENRY V. HUBBARD

At the closing banquet, addresses were given by Sir Clifford Sifton, Thomas Adams, Hon. Martin Burrell, Hon. W. J. Hanna, Hon. George Langley, J. L. McCarthy and Hon. George McAneny.

A special feature of the meeting was the extensive exhibit of photographs, plans and maps illustrating city planning progress in many of the leading cities of the United States and Canada.

The addresses of welcome delivered at the Conference by H.R.H. The Duke of Connaught and by Sir Clifford Sifton, as well as the address of the latter at the closing banquet, are printed herewith.

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## ADDRESS OF WELCOME

BY

H.R.H. FIELD MARSHAL THE DUKE OF CONNAUGHT

*Governor-General of Canada*

I look upon it both as a privilege and a pleasure to have this opportunity of addressing the first Town Planning Congress ever held in Canada.

Firstly, I consider that it was a wise decision on your part and a hopeful augury for the future to hold your initial meeting in Toronto. The energy, good taste and public spirit of its citizens have resulted in the construction of a very beautiful, spacious city, and I think the *genius loci* of the place will not be without effect on your deliberations.

Secondly, the question which you are considering is one that I look upon as among the most pressing of the many problems that are confronting the public men of our cities in Canada to-day. European countries, unfortunately, know only too well the evils that have arisen from want of foresight in Town Planning.

To begin with, houses and streets are allowed to grow in haphazard fashion. Later on, as a town increases in population, what was at first merely a want of method develops into a serious danger, and may end in the creation of a slum quarter, with all the physical, mental and moral decadence that the word "slum" involves.

Considering the terrible lessons that are so forcibly impressed upon one by these experiences in older countries, it would be nothing short of a national disaster if, for the want of proper forethought, a similar state of things was permitted to come into existence in Canada which is essentially a land of wide spaces, where there should be breathing room, not only for the present population, but for a nation ten times as large.

It is unnecessary to labour this point, on which we are all, no doubt, agreed. I think, however, it is not out of place to utter one word of warning. If the question is to be dealt with effectively, there must be no delay. The evil must be grappled with at once and drastically.

The flood of immigrants who land on our shores is of a formidable size. Already one hears disquieting reports as to the housing and sanitary conditions in some of our larger cities. It must be remembered also that, although the rural population of Canada at present exceeds the urban, that condition of affairs may not, and indeed is not likely to, last. We cannot ignore the history of the United States when we are considering the future tendencies of this country, and it is instructive to realize that nearly 50 per cent of the population of our great neighbour to the south is classed as "urban."

The whole question, too, is one in which prevention is far more effective than cure. Once let a vicious system be firmly established vested interests will grow round it, the uprooting of which must prove a lengthy, controversial and desperately expensive process. To deal with this potential evil, substantive legislation is absolutely necessary.

I feel confident that your discussions of the model Town Planning Act will not only bring about a wise and courageous piece of legislation, but will also do good by stimulating public opinion on the subject throughout the Dominion.

I do not wish to take up your time further, beyond directing your earnest attention to three important points, namely : the provision



of ample spaces for parks and playgrounds, the creation of main arteries of communication in cities, and last, and most important of all, the securing of proper and adequate housing conditions for our increasing urban population.

Gentlemen, you are about to consider questions in which is involved the future happiness of many thousands of your fellow-Canadians. You are going to set your brains to work on problems in which Canada should, and in which I devoutly hope she will, set an example to the world.

You have an inspiring, almost a unique, opportunity. I wish you God-speed in your labours, and I assure you again of the interest and sympathy with which I shall follow your deliberations.

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#### ADDRESS OF WELCOME

BY

SIR CLIFFORD SIFTON, K.C.M.G.

*Chairman, Commission of Conservation*

It devolves upon me to add a few words of welcome to the remarks which were made by His Royal Highness this morning. The Commission of Conservation, which I have the honour to represent, conceives that it does itself honour in becoming the host of this Conference on City Planning, in conjunction with the city of Toronto and the province of Ontario.

When our Commission of Conservation was organized four or five years ago, at a very early period in our deliberations we arrived at the conclusion that the public health was an important portion of the work to which we should devote ourselves. We thought that while it was vastly important to conserve our minerals and our forests and to increase the productivity of our fisheries and of our agricultural lands, and generally to conserve all those natural resources from which man derives his livelihood, it was still more important that the efficiency of the human unit, the health and the happiness and the vigour of the individual, should be preserved.

Therefore, we have taken some interest in the promotion of a greater degree of attention to matters pertaining to public health, and in so doing, we necessarily came into contact with the necessity for close, careful and systematic attention to the planning of our towns and cities, to the housing of the population and generally to the conditions under which our fellow-citizens were called upon to live.

It is, therefore, with sincere appreciation of the importance of your work that I welcome you on behalf of the hosts of this gathering to the deliberations which will follow the opening ceremonies which have now taken place.

There is a peculiar appropriateness in the fact that you are coming to Canada at our invitation in a year which is being signalized by the celebration of one hundred years of peace between the two great English-speaking nations, those two nations which we, with somewhat pardonable egotism, are accustomed to regard as the two greatest and most advanced nations in the world. You are coming here to solve problems which have arisen by reason of the peaceful progress of industry and of commerce.

It is but four or five years since the first practical word was spoken in regard to Town Planning in Canada. Previous to that time apparently no systematic attention had been given to the subject. The last three years have seen a very general awakening and not only has great interest been aroused, but there has been, at least in the city of Toronto, a practical effort made to cope with the necessities of the situation. Various organizations have devoted themselves to the improvement of living conditions in the city, and all with some degree of success. The Toronto Housing Company has gone a step further and has made a practical attempt to assist in solving the housing question.

The Toronto Board of Harbour Commissioners have instituted a great scheme of public improvement which you will hear discussed this afternoon. There is no doubt that this great scheme which the Harbour Commissioners of Toronto have inaugurated will, when carried to a conclusion, afford much needed relief in connection with the solution of civic problems in this city of Toronto.

We now have legislation on the subject of Town Planning in the provinces of Ontario, Alberta and Quebec, and this legislation is of such a character that it undoubtedly makes for substantial progress.

We are very far, however, from believing that the legislation which we have secured at the present time is sufficient for the necessities of the case, and one of the main purposes that we have had in view in requesting the presence of this Convention in the city of Toronto was to stimulate public attention upon the subject, to engage the intelligent attention of those who will assist us in carrying out our plans in the future, and by your counsel and by your discussions and by your assistance to help us to the promoting of legislation which we can recommend to the various legislatures of the provinces of Canada in the hope that with such backing we may

secure the correcting of this legislation and make it a part of the organic law of Canada.

We have in Canada to-day perhaps the greatest field in the world for a successful combat with the evils which Town Planning and Housing are intended to overcome. In almost every other country of great possibilities development has reached a stage which has resulted in the growth of very large cities containing great numbers of people packed together under most unhealthy and insanitary conditions. I am not at the moment referring to what are known as slums, but rather to the highly congested districts where, during certain months, life is hardly bearable. Anyone who has traversed the residential sections of the east end of London, or anyone who has looked down from an elevated train on a hot summer night to the congested district of New York, will readily understand what I mean. The conditions which have arisen are unfortunately incapable of radical remedy and can only be improved to a limited extent. The growth of very large cities is now so rapid and the habits of living so formed that it is practically impossible for public-spirited and philanthropic citizens to overtake the work which the housing problem presents. While much good may be done, yet it is, after all, but a small fraction of what remains to be done. The evils grow much faster than the remedy can be applied. In smaller centres of population better results can be obtained, but those of the larger class present conditions which at the best can only be partially ameliorated.

It is a peculiar fact, which has come under my notice lately in many large American cities, that where a movement is taking place to the suburbs, which ought to relieve the congestion of population, we find, unfortunately, that the people who are moving to the suburbs are not those from the congested districts, but from the well-to-do districts, from the districts where the people before they moved had no particular fault to find with their circumstances, illustrating still further how difficult it is to make any impression upon a large congested district in a great city. In Canada, our cities are not yet so large as to be out of control. I do not mean that we have not undesirable conditions. There are three or four of our cities—Montreal, Toronto and Winnipeg—which present conditions that demand a very radical remedy, and I think I would be safe in saying that hardly anything serious is being done in any of them, except in Toronto. But our cities are not so large that they are out of control, and it is still possible within the next ten or twelve years to relieve any evil conditions which exist at the present time, and to lay foundations which will effectually prevent any serious growth of undesirable conditions in the future.



That feature of the problem which has to do with Town Planning, with housing regulations, with building by-laws and so on, you are thoroughly competent to deal with, and there will probably be a pretty general agreement on policies and methods after the subject has been clarified by discussion.

There are, however, unfortunately some further phases of the question of congestion and over-population to which I merely make a passing reference, because they do not fall directly within the scope of the work of this Conference. It would appear to be the result of modern experience that the growth of a nation in population, in wealth, in the development of art and science, in everything that we are accustomed to call progress and greatness, has certain disagreeable accompaniments.

We invariably find large masses of people who, although living in a perfectly reputable way, are located in congested districts where health and physique steadily deteriorate. Secondly, we find the growth of what are popularly described as slums, which follow the growth of the congested districts, where people are herded together under conditions which make clean and decent living practically impossible, conditions which breed disease and crime.

It seems a terrible indictment of modern civilization, but it is undoubtedly a true one, that the growth of insanitary, unhealthful conditions, the growth of slums and slum populations, are in direct ratio to what we call progress. The immense growth of the city is invariably accompanied by these undesirable conditions. Why is it? If you solve this question, you solve the most important social question of the modern world.

People have been at each others' throats for generations about theories of government. But as a man who has been engaged in public life for over thirty years and has tried to make somewhat of a philosophical study of political conditions, I declare that the wisest man living can see little difference between the condition of people living where one of these theories is applied and the condition where the directly opposite theory is applied. Compare the United States, which is aggressively protectionist and which is only 140 years old, with free-trade England, where the conditions are the result of the play of social forces that have been going on for centuries, and both of them exhibit in almost equal degree, allowing for a difference in natural circumstances, the evils of which we complain.

We have many theories for the redress of social evils. Government ownership of public utilities, socialism and single tax are illustrations. The advocates of each claim that their particular theory will set everything right. Yet when we divest ourselves of

the enthusiasm which people are apt to acquire when they take up one particular idea, it takes very little serious consideration to lead one to the conclusion that while, perhaps, each one of the remedies suggested has some merit and may, under certain circumstances, accomplish some good, yet that no one of them would radically alter the law that has heretofore obtained with inexorable regularity ; namely, that the growth of poverty, misery and crime accompany industrial and commercial expansion on a large scale. Why is it that, as countries grow richer, the rich become richer and the poor become poorer ?

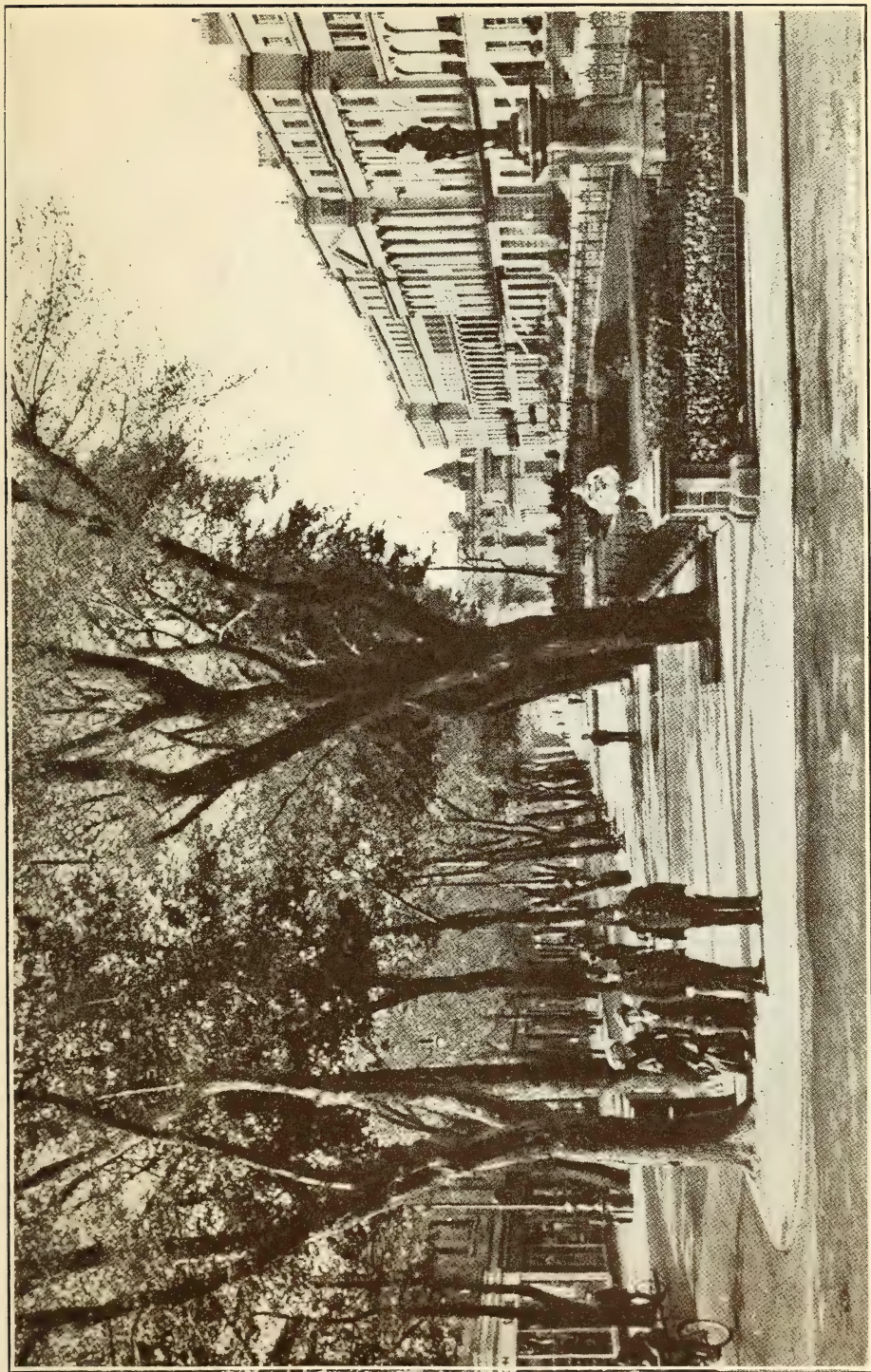
We are building immense buildings of polished marble and cut stone, with elaborate furnishings and decorations, such as in former times would have been considered finer than any emperor's palace ; and while we are constructing such buildings for ordinary business purposes, and paving our streets and lighting them in the most lavish way, until one can hardly tell the difference between day and night upon the great white ways of our cities, it is nevertheless true that alongside of this ostentatious, not to say extravagant, expenditure there is an increasing mass of poverty and destitution.

When in Canada we had a population of two and a half millions and were admittedly poor and insignificant, there was not real want ; no one was hungry, no one was houseless and crime was very rare. Now we have eight millions of people or thereabouts ; we have transcontinental railways ; we have great accumulations of wealth and some degree of importance in the eyes of the world ; and we are beginning to see slums, congested districts and the ever-widening division between wealth and poverty which marks the beginning of the growth of a proletariat.

Consider for a moment the case of Great Britain. Twenty years ago it was the richest country in the world. It has actually doubled its wealth in the last twenty years. During that period its population has increased only about 20 per cent. Nevertheless there has been in the last twenty years hardly any perceptible improvement in the condition of a large portion of the population, and it still remains the fact, as was stated by Sir Henry Campbell-Bannerman a few years ago, that one-third of the population live on the verge of starvation, while the most enormous growth in the wealth of a nation ever known in the history of the world has taken place around them.

A word to my American friends. Lord Macaulay once said that the time would come in the history of the United States when one-half of the population, after they got their breakfast in the morning, would not know where the next meal was coming from. That is a





THE PROMENADE GARDENS, CHELTENHAM, ENG.

This demonstrates the value of giving a park-like effect to a central business thoroughfare of a city. Shopping and business premises on one side of the street, and some of the principal residences on the other side. The special driveway to the houses is cut off from the main thoroughfare by the garden and trees.





condition which seems to come to every country with the increase of population. That is a condition which will come if matters are left to themselves to proceed as they have proceeded at other times, in other ages and in other countries. History will repeat itself unless something is done to prevent it. I put it to you that the real problem that is up to the intellect of this twentieth century is whether we have brains and capacity enough to free ourselves from the prejudices and the shibboleths with which our minds are encumbered, and to grapple with these problems so that society shall control its own destinies and avoid the evils which have dogged the footsteps of progress in the past.

You, perhaps, are not called on to deal directly with this economic question, but you must necessarily study and become familiar with the economic conditions under which your great work is to be done. You can give us what we want on the technical, the legal and the municipal side. You can give us the framework into which the ideal policies, when discovered, are to be fitted.

As to the answer to the question which I have propounded—what it is that causes these miseries and these masses of unhappiness which we all deplore—there is in my mind no doubt that it is impossible to give any single answer to the question. No one theory explains the fact. It is a composite problem and it requires a composite answer. But a part, and a most important part, of the answer is to be found in a rational system of Town Planning, a rational system of supervising the conditions in which the people in our great cities shall live.

No doubt until a short time ago the growth of congested districts followed by the growth of slums, and of the habits of living which have resulted have been in the main due to a lack of transportation facilities which would enable the residential area to be extended. Other obvious reasons are the lack of systematic oversight and foresight, crowding and the growth of population for which no preparation has been made.

But owing to modern science, there is now a remedy for these evils, and if any modern city fails to provide a proper method of transportation, in order to enable its population to extend its residential areas, then it is the fault of the people themselves, because the remedy lies close at hand. As to other difficulties, the experience which has been acquired and the lessons which have been learned in such conferences as this and been made available for popular use are now sufficient, if properly applied, to eradicate most of these evils.

We have invited you here to help us to begin our work in Canada on broad and comprehensive principles, and the purpose we have is to secure the basic legislation which will enable the whole question of Town Planning and Housing in Canada to be carried on in a systematic and orderly fashion. What is the best legislative foundation for this purpose will be for your consideration and discussion, and I have no doubt the result will be of the greatest value.

What I desire to say to you in closing is that the problem you are engaged upon is, in my judgment, one of the two or three great problems in the world to-day. It is more important than flying machines or wireless telegraphy, or battleships or armies. It has to do with the health and happiness of the average citizen, with the abolition of wretchedness and unhappiness. The solution of it will bring health and happiness to increasing thousands of our fellow-men.

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#### ADDRESS AT THE CLOSING DINNER

BY

SIR CLIFFORD SIFTON

When the Conference opened it devolved upon me to say a few words of welcome; and it now devolves upon me after the Conference has closed to say a few words by way of appreciation and gratification that we have you here as our guests, and that your Conference has been so extremely satisfactory and useful.

Of course one of the main objects to be attained in connection with a Conference of this kind is to secure a due measure of publicity. While it is an excellent thing that we have all these stores of knowledge ourselves, it is a still more excellent thing that we should get them communicated to the general body of the public, so that they may be put to practical use. I think under all the circumstances that we have reason to congratulate ourselves that our friends of the Press have treated us as liberally as they have.

As a matter of fact, this Conference has been competing for newspaper space under very great disadvantages. The Conference has been held at a time when His Royal Highness the Governor-General, a very popular prince, is making one of his visits to Toronto. The doings of His Royal Highness take up a good deal of space in the newspapers. Then you have been holding your Conference while the spring races have been going on at the Woodbine, which is the most important sporting and social event which the good city of Toronto sees during the twelve months of the year. Then there is



that incipient rebellion in Ulster, Home Rule, watchful intervention in Mexico and all that sort of thing has been going on, and all these things have been competing for space in the newspapers during the last week. And so I seriously think that our friends of the Press have treated us very liberally and considerately in giving us the good and full reports of our proceedings which they have given.

For myself, the principal desire that I had in connection with this Conference was first of all that we in Canada should become better acquainted with the ideas of our friends from the United States upon these subjects ; that we should get into touch with what you are doing and inoculate ourselves with your ideas ; and then I wanted to see that those ideas which you expressed were so fully reported in the Press that they would get to our public, so that the public of Canada would become impressed with the fact that Town Planning is not an expensive fad, a new way of spending money, but is an economical proposition, a proposition to save money and to get good value for money. That is the chief idea that I want to see the people of Canada get from this Conference.

I have the honour of being an officer of what we call our Commission of Conservation, and the germ idea of that Commission is to save money or to save money's worth, that is to save property, to save resources, to preserve things that have value, from being destroyed. And that is why we take an interest in the proceedings of the Town Planning Conference ; that is why we want to see town planning ideas spread. But I want to see them spread only if they are founded upon sound economic ideas. If it is another way of wasting public money (God knows there are enough of them now), if it is another way of wasting public money, then it does not appeal to me. But if it can be shown that this idea can be worked out on economic principles, so that returns will be made for the money that is invested—and let me tell you that is the only way it will ever succeed—it is the only way it will ever make its way ; when that is accomplished and we get that idea into our people's heads, then we will have no trouble in getting our plan adopted ; then we will have no trouble in getting the money which we require in order to carry these plans into effect. But our people must appreciate the idea that town planning is not born with the intent of spending money, it is not simply a new kind of extravagance, but is conceived with the idea of preventing extravagance and preventing waste and getting good value for the money which is expended. When that idea thoroughly permeates our people, we shall make progress, substantially and rapidly. I think that this meeting will go a long way toward getting our people to understand that idea, because the reading

of the discussions which have taken place, so eminently practical, so eminently sensible, so eminently based upon sound economic ideas, cannot fail to be impressive.

If I let myself go I shall find presently that I am making a speech, which I have no intention of doing. I simply desire to express my appreciation of your presence and of the success which has attended this gathering, and to express the hope, on behalf of myself and my colleagues and friends who have taken part in the movement to secure your presence in Toronto, that this will not be the last Town Planning Conference that will take place within the limits of the Dominion of Canada.

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# Appendix I (a)

## Discussion on "A Town Planning Act for Canada"\*

Being a Further Extract from the Proceedings of the National Conference  
on City Planning, held at Toronto in May, 1914

OPENING ADDRESS BY LIEUT.-COL. J. H. BURLAND

THE preparation of a comprehensive town planning measure, I need hardly say to you who have had so much experience in the details of town planning, is not a duty or task to be lightly assumed or easily or rapidly accomplished. The problem presents so many factors to be considered and indicates so many interests to be reconciled that it must of necessity occupy some considerable time.

The draft bill relating to town planning which I have the honour to present for your consideration to-night was drafted by a committee appointed by the Commission of Conservation. It is not put forward as the finished product of their labours, but is only the first draft and will be given much further consideration and study before it finally leaves their hands. The Committee will be glad to receive any suggestions which will aid them in perfecting the measure.

To those who are not acquainted with our form of government in this country, I may say that when the provinces or states of which Canada consists were brought together under the *British North America Act* in 1867, certain legislative authority was given to the provinces over matters of their own internal economy. For this reason, you will notice that the draft bill does not contain provisions for the appointment of one central Federal authority, because the Dominion has no authority in the matter ; therefore it has been necessary to provide for central authorities for each province.

The work of these various boards may be to a certain extent co-ordinated by an advisory body established by agreement amongst themselves, but such a body could have no mandatory powers. In brief, the bill provides, first, for the establishment of a central

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\* The draft Act submitted by Lieut.-Col. Burland and explained by him in his address, has been revised on lines similar to the Nova Scotia Act (see Appendix II). Copies of the revised draft can be obtained on application to the Commission of Conservation.



authority or board in each province, under the control of a Department of Municipal Affairs or an already existing Minister of the Crown. This board is given full and complete control of the town planning schemes of the province, and as it has not been considered possible to provide for all contingencies or situations that may arise in so great a problem, the powers allotted to the central board have been made wide and elastic. Provision is made for laying before the Provincial Legislature each year all general provisions and all amendments to such provisions by this board.

This central board has power to advise, approve or alter and confirm plans submitted by local boards or other bodies. In case of the refusal or neglect of local authorities to organize for the efficient carrying out of the purposes of this act, it has power to create the necessary local organization. No town planning scheme shall become effective until authorized by this board, and no money shall be raised or bonds issued for the purpose of carrying out these schemes without the approval and consent of this board. Where a scheme affects two or more municipalities, the board will indicate a responsible authority to carry it out. The board has power also to draft all rules and regulations, whether for its own guidance or the guidance of the local boards, and to settle all questions of procedure with reference to all questions arising under the acts.

Secondly, the bill authorizes the establishment by every city, town or other municipality of a local Housing and Town Planning Board, with a commissioner who must be skilled in town planning and with power to prepare a town planning scheme subject to the approval of the central board and to carry it out.

It further provides that the cost of making a town planning scheme shall be paid out of the current revenue of the municipality or out of a special tax which may be levied by the municipality for the purpose. It limits the amount of such tax to one-fiftieth of one per cent of the assessed value of property in centres of less than 200,000, and of one-hundredth of one per cent for cities of 200,000 and over.

It authorizes the local board to remove buildings and purchase land and execute work itself required for the completion of any authorized town planning scheme. It provides for compensation where property is injuriously affected by a town planning scheme, and provides for the collection of a tax upon property benefited by such a scheme.

It provides for arbitration on questions of valuation and damage, and for the purchase, expropriation or acceptance by gift of any property required for the purpose of this act. It also provides for

the acquisition of property within 200 feet of the boundary of any improvement authorized, and for the resale of the same after the improvement is completed. It finally provides that no property, tract of land or area shall be subdivided or sold as lots until the plan of such subdivision is approved by the local and central board.

### DRAFT OF TOWN PLANNING ACT

HIS MAJESTY, by and with the advice and consent of the Legislative Assembly of the province of

enacts as follows :

1. This Act may be cited as the *Town Planning Act 191*—

2. In this Act and in any rule or regulation made thereunder unless the context otherwise requires :—

(a) “Central Board” means the Town Planning Board of the Province of

(b) “Commissioner” means a Housing and Town Planning Commissioner appointed by a Municipal Authority.

(c) “Comptroller” means the Town Planning Comptroller of the Central Board.

(d) “Lands” includes lands, tenements and hereditaments and any interest therein, and also houses, buildings and other works and structures.

(e) “Local Board” means the Local Housing and Town Planning Board, and where the land included in any town planning scheme is in the area of more than one local Board, such Local Board or other authority as may be designated or appointed by the Central Board as the authority to be responsible for carrying out such scheme.

(f) “Minister” means the Minister responsible for administering municipal affairs.

(g) “Municipal Authority” means the governing body of a municipality.

3. The provisions of this Act shall be administered  
**Central Board** under the Department of Municipal Affairs by a town planning board to be appointed by the Lieutenant-Governor in Council, consisting of (a) a town planning comptroller, who shall be a permanent paid executive official, skilled in town planning and chairman of the Board, and responsible to the Minister ; (b) a person skilled in finance (the Deputy Provincial Treasurer ?) ; (c) (the Provincial ?) Medical Health Officer ; (d) (the Provincial ?) Architect ; (e) (the Provincial ?) Engineer ; (f)

the Deputy Attorney-General, who shall be members of the Central Board *ex-officio*.

**To Serve without Remuneration** 2. With the exception of the Comptroller, the members of the Central Board shall receive no compensation except for actual and reasonable disbursements made when on business connected with this Act.

3. The Central Board shall make an annual report to the Minister, containing the decisions, recommendations and other transactions of the Central Board during the year.

4. The Comptroller shall be the executive officer of the Central Board, and shall perform such duties and shall have such powers as the Central Board, by regulation, approved by the Lieutenant-Governor in Council may prescribe; provided that such powers shall not in any case exceed the powers possessed by the Central Board.

**Local Board** 5. Every municipal authority is hereby empowered to create a Local Housing and Town Planning Board, consisting of the Mayor (*ex-officio*), the Engineer of the municipality, the Medical Health Officer, and not less than two ratepayers to be appointed for two years, and to consist preferably of an architect and a financier.

(a) Such Board shall be a body corporate, and shall have power to acquire, receive and hold, sell, lease and dispose of lands and any interest therein and personal property.

(b) The Central Board may, upon its own motion, or upon the petition of at least ten ratepayers in any municipality, appoint a commission for such municipality.

(c) A Municipal Authority creating a Local Board shall appoint a Housing and Town Planning Commissioner, who shall be skilled in town planning, and shall be the executive officer of the Local Board, and who, with the Local Board, shall be responsible for the carrying out of the provisions of this Act, and of the regulations issued thereunder by the Central Board, and of the by-laws of the municipality.

(d) The Commissioner shall not be removed from office, and if he is paid a salary or other remuneration, his salary or other remuneration shall not be reduced except, in either case, with the approval of the Central Board.

**Local Board may make a Town Planning Scheme** 4. A town planning scheme may be prepared in accordance with the provisions of this Act with respect to any land already in use which is in course of development, or appears likely to be used for building or other



purposes, with the general object of securing suitable provision for traffic, transportation, proper sanitary conditions, amenity, convenience in connection with the laying out of streets and use of the land, and of any neighbouring lands for building or other purposes.

**Central Board may Authorize a Local Board to make a Town Planning Scheme** 2. The Central Board may authorize a Local Board to prepare such a town planning scheme with reference to any land within or in the neighbourhood of their municipality, if the Local Board satisfy the Central Board that there is a *prima facie* case for making such a scheme, or may authorize a Local Board to adopt, with or without modifications, any such scheme proposed by all or any of the owners of any land with respect to which the Local Board might themselves have been authorized to prepare a scheme.

**What Land Included in Scheme** 3. The Central Board may authorize a town planning scheme for any land already built upon, or any land not likely to be used for building purposes, if it be made to appear to them that such land is so situated that it ought to be improved, and may provide for the demolition or alteration of any building thereon so far as may be necessary for carrying the scheme into effect.

**Scheme not to have Effect until Approved of by Central Board** 4. A town planning scheme adopted by a Local Board shall not have effect, unless it is approved by order of the Central Board, which Central Board may refuse to approve any scheme except with such modifications and such conditions as the Central Board may impose.

**Scheme when Approved to be in Force** 5. A town planning scheme, when approved of by the Central Board, shall have full force and effect.

**Scheme may be Varied or Revoked by Central Board** 6. A town planning scheme may be varied or revoked only by a subsequent scheme adopted by the Local Board and subsequently approved of by the Central Board. Such application for variation or revocation of the original scheme may be made either by the Local Board or by any interested person. Notice of application for such variation or revocation shall be publicly advertised in such manner as may be directed by the Regulations of the Central Authority.

**Authority to be Responsible for Carrying out Scheme** 5. The authority to be responsible for the carrying out of a town planning scheme may be either :  
(a) The Local Board applying for approval of the scheme, or

(b) Where land included in a town planning scheme is in the area of more than one Local Board, such Local Board or other Authority as may be designated or appointed by the Central Board.

**Central Board  
to Draft  
Regulations, etc.**

2. The Central Board shall make regulations for regulating the procedure to be adopted with respect to applications for authority to prepare or adopt a town planning scheme, the preparation of the scheme, obtaining the approval of the Central Board to a scheme so prepared or adopted, and any inquiries, reports, notices, or other matters required in connection with the preparation or adoption, or the approval of the scheme or preliminary thereto, or in relation to the carrying out of the scheme, or enforcing the observance of the provisions thereof, and for such other purposes as may be found necessary.

**Contents of  
Procedure  
Regulations**

3. Provision shall be made therein :

(a) For securing co-operation on the part of the Local Board with the owners and other persons interested in the land proposed to be included in the scheme at every stage of the proceedings, by conferences and such other means as may be provided by the regulations.

**Notices**

(b) For securing that notices of the proposal to prepare or adopt the scheme be given at the earliest stage possible to those interested therein, and that the same shall be approved of by the Lieutenant-Governor in Council.

(c) For dealing with the other matters mentioned in the schedules of this Act.

**To be Approved  
by Legislature**

4. All general provisions and all amendments to such provisions made under this Act by the Central Board shall be laid before the Legislature at the next succeeding session thereof, but they shall have full force and effect after their publication in the Official Gazette.

**Area and Varia-  
tion of General  
Provisions**

5. Special provisions shall, in addition, be inserted in every town planning scheme, defining in such manner as may be prescribed by regulations under this Act, the area to which the scheme is to apply, and the Local Board which is to be responsible for enforcing the observance of the scheme, and for the execution of any works which under the scheme, or under the Act, are to be executed by the Local Board, and providing for any matters which may be dealt with by general provisions, and otherwise supplementing, excluding or varying general provisions, and also dealing with any special circumstances or contingencies for which adequate provision is not made in the general

provisions, and for suspending, so far as is necessary for the proper carrying out of the scheme, of any statutes and any by-laws, rules, regulations or other provisions made by a municipal authority, which are in operation in the area included in the scheme, and such special provisions shall have the same effect as if specially enacted by the Legislature.

**Funds, How  
Raised**

6. Special provisions may also be made in every town planning scheme prescribing the manner in which the funds necessary for the carrying it into effect are to be procured. If no such provision is made in the scheme, funds may be procured in any way authorized for local improvement or general purposes by any public or private act in force in the city, town, or municipality affected by the scheme ; provided always that no assessment upon any city, town, or municipality shall be authorized by any town planning scheme, without the consent of the municipal authority, or authorities, in control of the area affected being first had and obtained ; nor shall any power to borrow money either by the issue of bonds or otherwise be conferred upon a Local Board by any town planning scheme, except with the approval of the municipal authority, or authorities, in control of the area affected, and also of the Central Board.

(a) No by-law for the raising of money for any town planning scheme shall be passed, and no proceedings shall be taken for procuring the authority of the electors for the raising of any money, or the imposition of any tax or assessment to provide money for any town planning scheme until the consent thereto of the Central Board has been obtained, and any debenture or other security issued without the approval of the Central Board, as aforesaid, shall be void.

**Preliminary Ex-  
penses may be  
Paid out of  
Current Revenue**

7. Any expenses incurred in preparing any town planning scheme shall be paid out of current revenue by the municipal authority, or out of the proceeds of any special tax levied for that purpose on the demand of the municipal authority. The amount of such special tax shall not exceed  $\frac{1}{50}$  of one per cent of the assessed values of municipalities under 200,000, and  $\frac{1}{100}$  of one per cent of the assessed values of municipalities over 200,000. The Board shall expend such money in obtaining the necessary data and in preparing a comprehensive plan of improvement for the whole area of the municipality.

(a) Where a Municipality has established a Town Planning Board, the Board may require the assessment department of such municipality to report upon whether an improvement made by such Board has increased the value of a property more



than ten per cent above the value that the property would have had, had the improvement not been made, and if the said assessment department reports that it has, the said municipality shall impose and collect a double rate of taxation upon the said increase and shall pay one-half of such rate each year that the said assessment department continues to report the increase of value as aforesaid to the Town Planning Board.

(b) A local Town Planning Board shall prepare and constantly keep up a comprehensive plan of the whole territory, showing tentative schemes both in its developed and undeveloped portions, for the facilitating of the development of permanent improvements in sanitation, transportation, conservation and beautification of the municipality. It shall carry into effect as opportunity arises such portions of the improvements indicated on the comprehensive plan as its financial resources will permit, and as empowered by this Act. It shall also endeavour to secure such incidental improvements, both public and private, as are in accordance with its comprehensive plan.

**Power to Enforce Scheme** 6. The Local Board may at any time, after giving such notice as may be provided by the town planning scheme and in accordance with the provisions of this Act :

**Remove Buildings** (a) Remove, pull down, or alter any building or other work in the area included in the scheme which is such as to interfere or contravene with the scheme, or in the erection or carrying out of which any provision of this scheme has not been complied with, or

**Execute Work for Others** (b) Execute any work which it is the duty of any person to execute under the scheme in any case where it appears to the Local Board that delay in the execution of the work would prejudice the efficient operation of the scheme.

2. Any expenses incurred by the Local Board under this section may be recovered from the persons in default in such manner and subject to such conditions as may be provided by the scheme.

**Questions Arising, How Determined** 3. If any question arises whether any building or work interferes or contravenes with a town planning scheme, or whether any provision of a town planning scheme is not complied with in the erection or carrying out of any such building or work, such questions shall be referred to the Central Board, and, unless the

parties agree upon some other manner for determining the question, shall be determined by the Central Board, and the decision of the Central Board shall be final, conclusive and binding on all persons.

4. The Local Board shall have power to enter into an agreement with any person or corporation to do any work that the Local Board has itself power to perform, and so far as may be necessary for the purpose of doing such work. Such person or corporation shall have all the powers conferred upon a Local Board by this Act.

**Compensation** 7. Any person whose property is injuriously affected by the making of a town planning scheme shall, if he makes a claim for the purpose within the time (if any) limited by the scheme, such time not being less than three months after the date when notice of the approval of the scheme is published in the manner prescribed by regulations made by the Central Board, be entitled to obtain compensation in respect thereof from the Local Board.

**Time for Certain Compensation** 2. A person shall not be entitled to obtain compensation under this section on account of any building erected on or contract made, or other thing done with respect to land included in a scheme after the time at which the application for authority to prepare the scheme has been made, or after such other time as the Central Board may fix, for the purpose.

**Local Board Entitled to One-half of Increased Value** 3. Where, by the making of any town planning scheme, any property is, within twelve months of the completion of the work, or of the section of the work affecting such property, as the case may be, increased in value, if the Local Board makes a claim for the purpose, within the time (if any)—limited by the scheme (not being less than three months after the date when notice of the approval of the scheme is first published in the manner prescribed by regulations made by the Central Board), the Local Board shall be entitled to recover from any person whose property is so increased in value, one-half of the amount of that increase.

**Arbitration** 4. Any question as to whether any property is injuriously affected or increased in value within the meaning of this section, and as to the amount and manner of payment (whether by instalments or otherwise), or the sum which is to be paid as compensation

under this section, or which the Local Board is entitled to recover from a person whose property is increased in value, shall be determined by a single arbitrator appointed by the Central Board unless the parties agree on some other method of determination.

**Recovery of  
Compensation**

5. Any amount due under this section as compensation from a Local Board to a person aggrieved, or to a Local Board from a person whose property is increased in value, may be recovered summarily as a civil debt.

**Compensation  
where Scheme is  
Revoked**

6. Where a town planning scheme is altered or revoked by an order of the Central Board under this Act, any person who has incurred expenditure for the purpose of complying with the scheme shall be entitled to compensation from the Local Board in accordance with this section in so far as any such expenditure is rendered abortive by reason of the alteration or revocation of the scheme.

**Exclusion of  
Compensation in  
Certain Cases**

8. Where property is alleged to be injuriously affected by reason of any provisions contained in a town planning scheme, no compensation shall be paid in respect thereof, if or so far as the provisions are such as would have been enforced if they had been contained in by-laws made by the municipal authority.

**Spaces about  
Buildings and  
Area for Parks**

2. Property shall not be deemed to be injuriously affected by reason of the making of any provisions inserted in a town planning scheme, which, with a view to securing the amenity of the area included in the scheme, or any part thereof, prescribe the space about buildings, or limit the number of buildings to be erected, or prescribe the height or character of buildings, or the amount of vacant land to be taken for parks or open spaces, which the Central Board, having regard to the nature and situation of the land affected by the provisions, consider reasonable for the purpose.

**No Double  
Compensation**

3. When a person is entitled to compensation under this Act in respect to any matter or thing, and he would be entitled to compensation in respect to the same matter or thing under any other enactment, he shall not be entitled to compensation in respect of that matter or thing both under this Act and that other enactment, and shall not be entitled to any greater compensation under this Act than he would be under the other enactment.



**Local Authority  
may Acquire  
Property  
by Gift, etc.**

9. The Local Board is hereby authorized to acquire property by gift, purchase, or expropriation.

**May Purchase  
or Expropriate**

10. The Local Board may, for the purpose of a town planning scheme, purchase any land comprised in such scheme by agreement or compulsorily by paying the average assessed value of the last three assessments preceding the notice of purchase, plus a percentage to be determined by the Central Board in each case.

2. If the Local Board, or any person interested in the price fixed for any land under the provisions of this section, is dissatisfied with the percentage fixed by the Central Board, such Local Board or person shall have the right to apply to any judge of a Superior Court of the Province to appoint an arbitrator to determine such percentage, and the decision of such arbitrator shall be final and conclusive.

3. In the event of compulsory purchase, the arbitrators, or arbitrator, in deciding on values or compensation, shall take into consideration the increased value that will be given to any lands, buildings, works, or other premises by the scheme, or by reason of the enforcement thereof, and shall set off such increased value that will attach to such lands, buildings, works, or other premises against the inconvenience.

**Powers of Central  
Board in case of  
Default of Local  
Board to make or  
Execute a Scheme**

11. If the Central Board is satisfied on any representation that a Local Board

(a) has failed to take the requisite steps for having a satisfactory town planning scheme prepared and approved in a case where a town planning scheme ought to be made ; or

(b) has failed to adopt any scheme proposed by owners of any land in a case where a town planning scheme ought to be adopted ; or

(c) has unreasonably refused to consent to any modifications or conditions imposed by the Central Board,  
the Central Board may, as the case requires, order the Local Board to prepare and submit for the approval of the Central Board such a town planning scheme, or to adopt the scheme, or to consent to the modification or conditions so inserted. Provided that, where the representation is that a Local Board has failed to adopt a scheme, the Central Board, in lieu of making such an order as aforesaid, may approve the proposed scheme, subject to such modifications and conditions, if any, as the

Central Board may deem fit, and thereupon the scheme shall have effect as if it had been adopted by the Local Board and approved by the Central Board.

**Minister may En-  
force Observance  
of Scheme**

2. If the Central Board is satisfied on any representation after holding an inquiry, that a Local Board has failed to enforce effectively the observance of a scheme which has been confirmed, or any provisions thereof, or to execute any works, which under the scheme of this Act, the Local Board is required to execute, the Central Board may order the Local Board to do all things necessary for enforcing the observance of the scheme, or any provisions thereof effectively, or for executing any works which, under the scheme of this Act, the Local Board is required to execute.

**Mandamus**

3. Any order under this section may be enforced by *mandamus*.

**Local Board may  
Acquire Land  
within 200 Feet  
of Boundary Lines**

12. The Local Board, with the approval of the Central Board, may acquire, enter upon, take, use and appropriate neighbouring private property, within 200 feet of the boundary lines or proposed boundary lines of any street, public park, playground, or other open space, and shall resell the same as may be directed by the Central Board.

2. The proceeds arising from the resale of any such property so taken shall be used by the Local Board for town planning purposes as may be approved of by the Central Board.

**New Town  
Sites**

13. No street, road or right-of-way shall be reserved, laid out, granted, or conveyed, and no property, tract of land, or area shall be subdivided or sold as lots until the plan of such subdivision has been approved of by the Local Board, and consequently by the Central Board, and if there is no Local Board, then by the Central Board.

**Expenses of  
Administering  
Act**

14. Any expenses incurred by the Central Board under this Act shall be paid out of any funds appropriated for the purpose by the Legislature of the Province.

## SCHEDULE A

MATTERS TO BE DEALT WITH BY GENERAL PROVISIONS  
PRESCRIBED BY THE CENTRAL BOARD

- (1) Streets, tramways, roads and other ways, including stopping up, altering or diverting of existing highways.
- (2) Buildings, structures and erections.
- (3) Open spaces, private and public.
- (4) The preservation of objects of historical interest or natural beauty.
- (5) Sewerage, drainage and sewage disposal.
- (6) Lighting.
- (7) Water supply.
- (8) Ancillary or consequential works.
- (9) Extinction of variation of private rights-of-way and other easements.
- (10) Dealing with or disposal of land acquired by a Local Board.
- (11) Power of entry and inspection.
- (12) Power of the Local Board to remove, alter or demolish any obstructive work.
- (13) Power of the Local Board to make agreements with owners, and of owners to make agreements with one another.
- (14) Power of the Local Board to accept any money or property for the furtherance of the objects of any town planning scheme, and provisions for regulating the administration of any such money or property.
- (15) Application with necessary modifications and adaptations of statutory enactments.
- (16) Carrying out and supplementing the provisions of this Act for enforcing schemes.
- (17) Limitation of time for operation of scheme.
- (18) Co-operation of the Local Board with the owners of land included in the scheme, or other person interested by means of conference and other means.
- (19) To hold or to order the holding of any public inquiry deemed necessary or advisable by the Board.

## SCHEDULE B

1. Procedure anterior to and for the purpose of an application for authority to prepare or adopt a scheme.
  - (a) Submission of plans and estimates.
  - (b) Publication of notices.



2. Procedure during, on, and after the preparation or adoption and before the approval of the scheme.

(a) Submission to the Minister of the proposed scheme, with plans and estimates.

(b) Notice of submission of proposed scheme to the Minister.

(c) Hearing of objections and representations by persons affected, including persons representing architectural or archæological societies, or otherwise interested in the amenity of the proposed scheme.

(d) Publication of notice of intention to approve scheme and the lodging of objections thereto.

3. Procedure after the approval of the scheme.

(a) Notice to be given of the approval of the scheme.

(b) Inquiries and reports as to beginning and the progress and completion of works and other action under the scheme.

4. Duty, at any stage, of the Local Board to publish or deposit for inspection any scheme, or proposed scheme, and the plans relating thereto, and to give information to persons affected with reference to any such scheme or proposed scheme.

5. The details to be specified in plans, including wherever the circumstances so required, the restrictions on the number, location, purpose and dimensions of buildings which may be erected on each acre, and the height and character of such buildings.

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## DISCUSSION

MR. THOMAS ADAMS, *London, England* :

I feel somewhat in a difficulty to-night because probably the right attitude to take in opening a discussion is to criticize the matter before you, and, in the light of our experience in England, to suggest the defects of this measure, for the benefit of the Committee, as far as one can judge them, and to put these before you for discussion.

But I confess that course does not appeal to me, and I want you to accept the view I take that it will be better to put before you the position which we have taken up in regard to town planning in England, and give concrete instances of the preparation of town planning schemes rather than to attempt to criticise the act which has been prepared by this Committee.

In a general congress of this kind our duty should be first to settle general principles and leave details for the consideration of the Committee, which has already done such excellent work, in conference with those who are qualified to consider details from the legal, architectural, engineering and other points of view.

Now there are, no doubt, those who think that a measure of this kind, so drastic in its provisions, may go too far. In the past they have had to be content with general regulations, and they have feared the effect of such regulations on the liberty of the subject, and their ultimate effect in consequence upon industries and upon the growth of a Dominion of this kind. There are those, no doubt, who will fear that a measure of this character which goes so much beyond what has been hitherto in force will upset ordinary conditions and produce new difficulties, even though it produces some good effects as a result of being passed into law.

And there are those also who will say it is all very well for the mother country to have this "grandmotherly" legislation and to try to "town plan" its old cities, but they have not the difficulties with which we have to contend. But I think that it is not the right way to approach this question, because, after all, although we in the mother country have not the same difficulties that you have, we have our own difficulties, which are quite as great in degree as those with which you have to contend. The difference in our difficulties is not in degree, but in character, and you have to bring in proposals which will, I hope, help to secure the same results as we are trying to secure in England, but with that measure of alteration and that application of common sense in regard to local conditions which will enable you to adapt our town planning to your particular needs.

Now I hope you will pardon me if I try to remove some of what appears to me to be misapprehension regarding what town planning is. For instance, in the discussions at past congresses there seemed to be some doubt as to whether town planning is the same thing as the Garden City, or whether the Garden City was a form of town planning, or what city planning or town planning means. Well, having been associated with all these movements in one way or another, I have it perfectly clear in my mind, and I will endeavour to explain what seems to me to be the right interpretation of these movements.

The Garden City movement, which was explained last night and illustrated on the screen, is a private enterprise. It is a proposal to found new towns on agricultural land, removed from existing centres, with the object of transferring industries as well as the homes of the work people to these new centres, and one of the funda-

mental principles of that movement is that the conversion of the agricultural value into building value shall go to the community that creates it.

That is to say that in England, if an estate is purchased at \$200 per acre for the purpose of creating a new city, a station opened, public services provided and a town of 10,000 inhabitants has been set up, so that the land which was purchased at \$200 is now worth ten or twenty times as much, it is proposed that after satisfying the reasonable demands of capital, to the extent of five per cent on the money which has been invested, the whole of the rest of the profit which accrues from that development shall be returned for the benefit of the community.

That is not the kind of enterprise which could be fathered by a municipal authority or by a Dominion or a Provincial Government, but it is a movement which has been most useful in England as a guide to the legislature and as a stimulus in regard to town planning.

Another essential feature is that the town shall be designed from the outset. That everything in regard to the life of the community thus created, every need which a community requires and which is necessary for the purpose of satisfying all the conditions of communal as well as individual life, shall be provided by the exercise of foresight and judgment from the very beginning.

Secondly, there is the Garden Suburb movement, of which Hampstead is an example, also to some extent a private enterprise. It is the development, not of an independent Garden City, forming a self-contained unit, but of a suburb on the fringe of an existing town, under similar regulations to which the residential portion of the Garden City is subject. If you had a company formed, such as the Toronto Housing Company, to acquire two or three hundred acres on the verge of Toronto and to lay that out, prepare a plan, provide for the needs of different classes of people, provide transit to it and so on, that would be a Garden Suburb. And perhaps one of the essential features of it would be that the dividend would also be limited and that the community would benefit from the increased value which accrued from the development.

Now I hope it is quite clear that these two movements, while having a relation to town planning and necessarily able to take advantage of it, by reason of being new developments on existing agricultural areas and not redevelopments of existing built-upon areas, are not in themselves, strictly speaking, town planning schemes and have no direct relation to what we call town planning legislation.

The next point is as to the distinction between what is called city planning and town planning, and on that point I think that those



who form this conference, whether from the States or from Canada, have come to recognize that it is of much wider application than it has had in Germany, Italy, Sweden and other European countries.

City planning under German and Swedish laws is the control of the street lines, the laying out of boulevards and open spaces, the control of sky lines in building, the control of elevations of the buildings on the main streets and other matters which are concerned with the monumental side of the town rather than with the home life of the people.

For the purpose of illustration let us adhere to that as the interpretation of city planning, and then we return to the question of what is town planning as interpreted by the English act and as proposed to be interpreted in this act which is now being submitted to your consideration.

Now town planning in brief includes the consideration of every aspect of civic life and civic growth. There is nothing in the development of a city which does not come under the purview of town planning properly understood. And the essence of town planning, as the essence of city life, is the safeguarding of the health of the community and the provision of proper homes for the people. On that basis we have to build up the whole of our theory and practice on the subject. The first essential in the development of a town is that the people who form the units of the community shall live in healthy conditions and that everything shall go to the proper ordering and the proper control of the public health within that community.

It is an essential part, it is true, of the healthy life of the community that they should have factories to work in, light and air in these factories, places for their children to play in, baths for them to wash in and all the pleasing amenities of a civic community.

It is also true that when a community reaches the stage which Toronto has reached, the stage of wealth and importance and prosperity to which Toronto has now come, you have to look after not only the kitchen, not only the living room, but the front parlour of your city. Your main streets and your boulevards, your playgrounds, your university buildings and your other monumental structures require to be adapted to the dignity and importance of your city. It is true that these things are essential in the life of a great community of this kind, but only because you can afford them as matters of luxury, after you have considered the real essentials of the home life of the people.

In a great hotel it is necessary to have a fine vestibule, a fine reception room, but the real essential thing to make the guests

comfortable is that the kitchen shall be clean and properly ordered and that the bedrooms shall be comfortable.

A great community may be likened to a great hotel. Your boulevards and your public places, your parks and your baths, and so on are the vestibules and the reception rooms. Your factories and your workshops are the kitchen and the sculleries, and your homes are the bedrooms where the people sleep and live and where you want to rear not only men and women, but men and women who will be happy and who will be efficient workers.

It is because, I think, we all realize these things that we applauded so freely the remarks of His Royal Highness the Duke of Connaught, when he said that this was not only an important matter, but was a matter of extreme urgency in this great Dominion of Canada, as it is also in the States.

You cannot look around and see what is happening in this city of yours, or in any of the great new cities on this continent, without feeling that there is more control needed, that there is something needed to preserve the health of the people who are coming out to live in your cities. It is not only a matter of extreme urgency, but it is a question to which the best brains and intelligence of this community ought to be directed.

It wants skill and foresight and imagination. You as a Dominion, just as the great United States, have displayed in regard to many matters an imagination which is our admiration in the old country, and in regard to this matter we feel that these very qualities which have helped to build up your enterprises and make you a great commercial community ought to be directed to securing healthy conditions for those who are helping to make your wealth.

I thought it would be well to try to impress upon you the wide application, the broad conception which I think you should have of what town planning is. Yesterday we had a description of Toronto harbour. That is an important part of town planning, but it is not a part which ought to be considered alone. It is a part of the future industrial equipment of this city, and it is a part that ought to be considered in relation to every other thing which is necessary for the building up of this city in the future.

In England we have come to the view that while it is important to cure the evils that have been created, to relieve the slums and correct the building lines, to control the height and character of existing buildings—while these are important—we have come to the conclusion that they might wait a little, or at any rate that while we will not delay in the dealing with these matters, the first essential

of a wise community is to see that the evils that have been handed down to us shall not be handed down by us to those who come after.

We have, therefore, an Act of Parliament which enables us to regulate all future development on land which is not already built upon. And with that object we are trying to apply town planning throughout the whole of England according as the authorities are willing to set to work. In addition to that we will not cease to correct the evils which have been created. We have growing communities just as you have. During the ten years previous to 1911, London grew to the extent of nearly 900,000 people. That is a population nearly twice the number now residing in this city. The development of the land which is occupied by the houses in which we live is controlled by by-laws. We have, I think, some of the best regulations in regard to sanitary matters which are known in the world ; but in spite of these, amenities are being destroyed, building lines are being formed and difficulties are being created which can only be controlled by proper town planning schemes and which it is our intention to see shall be controlled in the future.

Now, with the object of illustrating these things I want to take up a little of your time with a few lantern slides, to indicate to you some of the things we are doing.\*

The Romans looked after the public places and monumental buildings and they neglected the homes of the people. When the Macedonian era came, they began to have regard to the health of the people who were living in the towns. In more modern times, I think almost up to the time when the great railways came, we paid regard to amenities and to the planning of our towns. One can almost trace the reaction against town planning and town orderliness to the moment that the railways were laid down in the old country. They upset all calculations, they cut into all town plans and they broke down many of the good schemes which were then in course of development. Many of you who know my own native town of Edinburgh know how well laid out the newer part of that town is, and the whole of that was due to the fact that it was town planned from the beginning and that the work was placed in the hands of the best skilled men. When the railways came, that was checked. I could take you to Edinburgh now and point out to you half-finished houses which have stood with the ragged gable ends from the time the railways were laid down. The ideas of the people of those days were to lay out the town and to develop along the lines of the plan, but as soon as the railways came in and interfered, they felt that there was a force at work which they could not control. The public places

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\*The remarks which follow were descriptive of lantern slides.



and the monumental features were matters of very early consideration in the history of London. Had a town planning act been introduced one hundred years ago, the greater part of London as it now is would have been properly laid out ; the main arteries would have been considered ; the building lines fixed and other matters been under control. The town planning act came in 1909, and we have now to consider the development of the small remnants of unbuilt-upon land that still remain in London. Millions have been spent in London on great street improvements and on the removal of slums. The county of London consists of nearly 700 square miles ; the city is only 117 square miles. The population numbers about seven millions. There has been an actual doubling of the population every thirty years within what is known as the outer circle. We are now considering the improvement of our arterial and circular roads. We have to deal with an increasing volume of heavy traffic and of rapid motor traffic. One of the most important things that town planning deals with is this question of arterial road communication. The Local Government Board has delegated me to attend conferences to deal with this matter for a time, and an effort is being made to concentrate upon this particular problem.

It is sometimes said that you do not want great wide streets, and I agree that one can be extravagant in regard to the width of thoroughfares. This is a technical matter that I think town planners should consider in giving advice to those in authority.

With regard to the cost of wide streets, the city engineer of Liverpool recently said that he had been able to convince his Council that the making of a street, for the purpose of running tram cars, 120 feet wide would be cheaper than the making of a street 80 feet wide. That, of course, sounds ridiculous, but the reason is this : On a street 120 feet wide you can provide for your tramways to run on grass : the rails are laid on sleepers set in grass. But if the street is only 80 feet wide, you have to put down granite sets and lay a concrete foundation for the tramway and incur other expenditure, which makes it quite as costly for the 80 feet as for the 120 feet. In other words, the saving in the cost of construction enables you to buy the extra land. That point ought to be considered when you are considering the question of transport facilities. In considering the introduction of an act of Parliament for the various provinces, I think you are to be congratulated on approaching it from the British point of view.

I want to read to you a cutting from the *Westminster Gazette*, one of the principal of our London papers, a statement with regard to town planning in Germany which, I think, might have saved many

discussions at previous conferences had we had this position put before us clearly on other occasions. A Berlin correspondent writes as follows to the *Gazette* :

"The lack of working-class dwellings, which in many towns is almost a housing famine, is in part the result of the present town planning system which so delight superficial persons. In parts town planning is being reformed on principles borrowed from England, but the unregenerate town planning still practised by the more important municipalities drives building-land prices to extravagant heights and militates against the provision of dwellings. The Minister of Commerce told the writer that land in Berlin cost \$15 to \$25 a foot as against two dollars and a half in London."

That is a result of the new condemned five-story flat-barracks system with its broad streets. The argument is that by imposing town planning schemes with very wide streets, you make the price of the land so high that you cannot provide satisfactory dwellings for the people. That is a point that town planners ought to bear in mind.

In a Birmingham town planning scheme about 2,500 acres are included. The roads are from 80 to 100 feet wide, intersecting the area and have been planned in advance, for the main arteries. The 80-foot streets are for principal highways on which tramways are not to be laid. Then there are 40 and 20-foot streets for residential purposes. In England we usually have 36 to 40-foot streets, the reason being that when you work under general by-laws you are bound to have a general standard instead of provisions for special circumstances. On the proposed 20-foot streets in Birmingham the buildings cannot be erected nearer to each other than 72 feet, so that you give the owners the benefit of the cheapest street and you get for them much greater air space between the houses.

It is frequently a waste of money to pave the whole of a 100-foot street. Such a street should often have parkways for the people to enjoy, as you have in Rochester, one of the most pleasing towns in the United States. One of the things I admire, although I do not see how you get people to maintain them properly, is the way in which you leave the front grounds of your houses entirely open to the public.

In the area of Greater London there are 137 local authorities, and these have agreed to join in conferences to try to settle the question of the town planning of Greater London. Two representatives of each authority have been appointed to the conference. The area has been divided into six sections, one conference dealing with each. The principal government departments are also represented at the conferences. One of the town planning areas in Greater London is

known as the Ruislip area. It comprises 6,000 acres. The scheme will, within two or three weeks, be an act of Parliament. That means that it cannot be altered or revoked without the consent of Parliament, except in those matters specifically mentioned which can be altered by the Local Government Board. The scheme deals with the construction of streets, the widening of existing streets, the adjustment of boundaries, the relaxation of by-laws, the submission of schemes for the development of small areas, the sanctioning of modifications, the diversion and closing of highways, the limitation of the number of houses to the acre, the restrictions in the height and character of buildings and in the amount of cubic space that any one building may have, and so on.

You will, no doubt, regard it as a revolutionary scheme. No more than four houses to the acre can be erected on one portion, no more than six on another portion ; that is, each house must have an average of one-fourth and one-sixth of an acre in these portions. In the industrial area no more than 12 houses to the acre can be erected. No factories can be erected within the area except in certain spaces adjoining the railway. No shop can be permitted on one part of the area. With regard to the limitation of houses to the acre, perhaps you will say that it is an extraordinary proposal and that we are going to confiscate the owner's property. But only one owner objected, and his objection was met. You have to remember that when you place a restriction of this kind upon property, you are giving an added security to owners which they cannot have when they ask for the full liberty with regard to their land. And that restriction is as valuable to them when they have residential land as if you gave them entire liberty to do as they like with it.

When dealing with shops and industries, there are, of course, areas where much larger proportions will be devoted to these purposes ; but the Ruislip scheme is agreed between the owners and the local authority and is primarily residential. In this case the restrictions become an act of Parliament, and no departure can be made from them without the consent of Parliament.

If you want wide main arteries you must have narrow streets in some places, so as to secure economical development and make the provision of ample air space economical. Cheap houses can be provided within areas which are town planned, with proper regard to economy in the construction and layout of streets. Refinement of architecture and spacious surroundings lead also to refinement in the interior of the home.

The imposing wide streets in Germany cause the crowded and unhealthy conditions in which the people are living at the back of



these streets, and this has led to the statement that town planning is disastrous to the proper provision of homes for the people. That is because they interpret town planning in the wrong way in Germany, and that is one of the things we have to avoid.

The land is so valuable in German suburbs that they cannot build houses less than four or five stories high. High buildings cause land values to be high. In framing legislation we have to avoid the extravagant town planning which will make it necessary to build up our suburbs in this manner. The zone system in Cologne is familiar to many of you. I may say that in Germany in that respect they are working along lines similar to those that we are following in England, restricting the height and character of buildings in different areas surrounding the large towns.

It is quite essential that people should have healthy conditions in which to work as well as healthy houses in which to live. Hence the importance of designing your factory areas and having plenty of open space surrounding the factories and workshops. The city of Edinburgh affords an example of the advantage of town planning. The new town of Edinburgh was laid out about 1783 by an architect named Craig. There you have all the advantages of imposing architecture and spaciousness without great cost, simply because the design was made before the buildings were erected.

In the somewhat general survey of our English conditions I have given you some idea of the character of our Town Planning Act. You can purchase a copy of the Ruislip scheme when it is through Parliament\* from the government printers.

There is one other matter, however, with regard to that scheme to which I must refer before closing. Clauses 36 to 56 secure that no building shall be erected nearer to the property line of existing streets than from 15 to 35 feet. That is to say, there must be a setback of from 15 to 35 feet on existing street lines.

Secondly, on proposed streets no building can be erected nearer to the frontage line of the street than 15 feet. In certain cases, such as shops and corner plots, there is a slight relaxation of that provision. These clauses also secure that the houses shall be limited in number to the acre in the way I have indicated to you on the plan—four in one case, six in another, eight in another, twelve in another, per acre. They also provide that there shall be control of the architectural elevations, that no building shall be of more than six stories, and that in the case of domestic buildings no building shall be higher than the distance between the front of that building and the opposite side of

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\* The Ruislip-Northwood scheme is now an Act of Parliament and can be purchased from Messrs. Wyman & Sons, Fetter Lane, London, Eng.

the street. They also determine that there shall be a minimum amount of cubic space in the rooms, that no living room can be less than 12 feet by 12 feet, and that advertisements which will interfere with the natural beauty of the landscape will be prohibited.

Now the important point is that under the act the Local Government Board has declared that all these things are reasonable, and this declaration *ipso facto* excludes any claim for compensation. No owner can claim compensation on the ground that he is limited in the number of buildings to the acre, that he is prevented from erecting shops and factories on certain spaces, that he is prevented from putting buildings nearer to the edge of the highway than 15 to 35 feet in the case of existing roads, or 15 feet in the case of proposed roads, the board having decided that these provisions are reasonable, for the purpose of the amenity of the area. So far no owner has raised an objection which has not been met.

Now I think I have given you some idea of the very wide powers which you propose to take under your town planning legislation. I hope I have not in any way caused you to think that you ought to deflect from the path of righteousness which you have chosen to follow. I trust that in this matter you will not be lacking in courage any more than we are in the old country. We are usually regarded as being slow-going and not having the spirit of enterprise that you have here. Do not let it be said that you are behindhand in regard to town planning. You are a great commonwealth; you are attracting from our cities and from our hills and our valleys the blood and bone and sinew which we have reared; you are taking away our young and healthy men and women; do not confine your attention to seeing that they are healthy when they enter your ports; give them happy homes, wide breathing spaces; let them keep not only their health of body, but let them develop the souls which God has given them.

THE CHAIRMAN, ALDERMAN S. MORLEY WICKETT, *Toronto*.

I think that applause indicates very clearly that the subject is a fascinating one and has been admirably presented. The discussion, so far, I think, suggests to us that town planning leads us closer to the ideal of efficient business life and sound city government. It seems to me almost an ideal way of getting what in America is known as commission government in one very important part of our municipal affairs.

Before asking Dr. Hodgetts to discuss the plan of the bill in detail, I would like to ask Mr. Adams if he would care to make some few critical remarks, giving his opinion somewhat more specific-

ally as to the Town Planning Act that is before the convention tonight. I am sure we would all appreciate any estimate that Mr. Adams cares to make of the act before us.

MR. ADAMS : I think that having taken up so much time, in spite of your very kind invitation, I should prefer if you will allow me to deal with it in another way. If I can be of any service to the Conservation Commission in considering the details of that act, I shall be happy to sit down with them and discuss the matter. But to criticize it now in its present form would, I think, be somewhat premature, because most of us here have not considered and studied it in a way which will enable us to judge whether my criticism might be right or wrong. On the whole I am not in a position to criticize this draft act. So far as it would be applicable to our condition it is admirable, but I do not know your conditions sufficiently well to be prepared to say that any criticism I could bring would be sound. If you will allow the discussion to continue, I shall be pleased at the close of it, if the time permits, to answer any questions addressed to me. I should like to confer with Lieut.-Col. Burland and his colleagues in regard to the act and give any service I can in discussing it with them. In putting forward any suggestion of my own in regard to any particular clause, I should like to ascertain from them first how this would affect you in regard to existing legislation. You have different legislation from ours, and the United States have different legislation. It is based on the principle of democracy, and the matter requires to be considered so as to secure the benefits of town planning without interfering with local autonomy. I think we are agreed in England that some central department which can bring to bear expert opinion and impartial judgment on many of these matters and be a Court of Appeal in regard to them is a useful institution. But I do not know how far you can apply that in Canada.

The only criticism I should venture to suggest, and it cannot be called a criticism of the proposed act, is a reference to the unique situation on the suburbs of your towns. You have in the suburbs of cities like Toronto a difference between the agricultural value and the building value of land much greater than the similar difference in England. This is partly due to the fact, perhaps, that you have not sufficient transportation into these outlying suburbs. It may be due to the fact that the imagination of your real-estate men is very strongly developed. That may cause considerable difficulty to you in regard to town planning. How to deal with it is not for me to say. But I would certainly like to say this : that before you settle on the points in regard to this act, the Commission should consider closely the lessons that we have learned in England since the Act of



1909 came into force, and how far these lessons may influence you to amend the draft now before you.

Comparing the proposed act with the other town planning acts in the various provinces, it seems to me to have been a little more carefully considered and to be a good attempt to adapt the provisions of the British act to the special conditions of the Dominion.

DR. C. A. HODGETTS, *Ottawa*.

I am sure, speaking as a member of the Committee, that we are all deeply grateful to Mr. Adams for his remarks here to-night, although they are not along the lines of criticism. We have learned a great deal from him, and I trust that before he leaves for England the members of the Committee will be able to meet him personally and discuss many of these matters with him.

I can say that it was the object of the Committee that town planning in Canada should begin along right and proper lines. It was not so much the city beautiful as the city healthy that we wanted for Canada.

Imbued with that motive the Committee started to work, and they have made this draft which you have in your hands to-night. As the chairman of the Committee has stated, we do not consider it perfect. It is open for your criticism. The Committee fully realize that there are provincial difficulties in respect to municipal matters, existing laws that will require certain changes in the bill, when it is discussed by the several legislatures, in order to adapt it to the needs of each province.

In the past our legislatures have dealt with matters relating to the farmer with a somewhat free hand. You can bring up any subject you like relating to the farmer before parliaments and the legislatures and the Federal Government will lend a ready ear. But matters relating to urban municipalities have been somewhat neglected. However, it is quite evident that the legislatures have changed their minds as to the necessity for considering the interests of the town dwellers, and already some of them have passed town planning acts, which have been referred to.

The one in Ontario is rather a remarkable act for such a large and influential province, and it does seem strange that the legislature should have deemed it proper only to pass an act on town planning relating to towns which have reached the size of 50,000. They allow the villages and towns in the province to commit all the faults and to begin all the evil conditions which have been observed in Germany, France, Great Britain and the United States, pile them one on top of the other, and then they say after these towns have reached the population of 50,000 they may turn back and undo all

these costly mistakes. It is high time that this province should get to work and pass a bill worthy of the province and of all the good such a measure means to the people, and then we would not see the city of Toronto repeating the mistakes which will make its outlines a hideous blunder on our map.

In regard to the method of the administration, the bill provides that the Provincial Government shall establish a central organization. You will find that on the first page, Clause 3, of the draft bill, where it refers to the formation of the Provincial Board. That board is composed of a number of provincial officers who, it is expected, will give their services and their advice to the towns and cities of the province.

Then, in addition to that, there are the local boards, to consist of the mayor *ex-officio*, the engineer of the municipality, the medical health officer and not less than two ratepayers, to be appointed for two years, and to consist preferably of an architect and a financier. In this way it is proposed to remove the important matters in connection with town planning out of the hands of our municipal councils. Speaking freely, as a Canadian, I may say, after twenty-seven odd years of public experience, that I am not impressed with the achievements or the capabilities of "town councils." I quite agree with the Chairman that the time has come when something else must be done, and possibly this will be one of the methods of getting better days for our cities.

I desire to be very brief. The principal points the Committee want to get at are what shall be the basic principles of the Town Planning Act for Canada, then what elasticity should be given and how. The Committee feel that they have got at most of the basic principles and that the elasticity will be found in the regulations contained in the schedules to the act. I think you will be able to meet and overcome the local difficulties by means of regulations that cannot be, and indeed should not be, provided for in the act itself. This is clearly shown by the experience in Great Britain. The Local Government Board there has seen fit within a very short time to alter and amend their regulations. If they had been part of the act itself this could not have been done without going back to Parliament.

I would like to say to our American friends that our methods of legislation in Canada are somewhat different from those in use in the United States. Our Committee considered the report of the Chicago Conference, which contained a number of acts the main provisions of which, I think, are incorporated in this one general draft bill. We consider one good act better than a number of acts, passed each for a special purpose, which might produce a sort of patchwork, and if one piece was left out it might ruin the whole.

MR. C. H. MITCHELL, *Toronto.*

The study which the Civic Guild has given to this act has been entirely with a view to helping in the construction of some practical legislation, which we are all trying to obtain. The Civic Guild is an organization of Toronto citizens which has for its object, one might say, the same objects of town planning and civic improvement as the National Conference on City Planning in which we are now assembled. It bears the same relation to the city as the Conference bears to the country, so that we are all trying to obtain the same results.

I may say that in the small study we have been able to give to this proposed legislation, we have found several things on which we want light. I will mention two or three because, perhaps, they will have the effect of bringing out some discussion, from some of the outside members, and that, after all, is what we in Toronto and in this province and in this country would like to have, because we are now in the work of town planning and we are seeking for all the light we can get, particularly from across the sea and from our neighbours to the south.

The first point is how best the work of the local board can be kept clearly defined, and yet so that it will co-ordinate with the other work of the officials of the municipality. There is a chance for friction to creep in, as it is well known it may in all municipal organizations. To avoid that is one of the prime objects to be obtained.

Another point I think you will find under Clause 3, Paragraph 7—how the local board may best arrive at the increment in land value due to and arising out of any town planning scheme which has been put forward. I fancy that question will create more discussion than anything else which will arise in connection with this draft. I have heard it discussed on various occasions in the last few days, and I would particularly like, sir, to hear from any members from the United States who care to give us their views on the possible process by which that increment can be arrived at, and then having once arrived at it, how best the money can be obtained from the people, the owners who are affected—particularly so in the case of owners who are poor people, who cannot supply the necessary amount which is in the nature of a tax. I would refer particularly to the case of small holders whose land has increased in value four, six or even ten times within a few years.

These are some of the salient features which Dr. Hodgetts has in mind and which I drew to his attention yesterday.



MR. W. F. BURDITT, *St. John, N.B.* :

I just wish to say that I think New Brunswick, having enacted a town planning act rather more than two years ago very similar to the one now proposed, would hardly feel inclined to repeal that act for the purpose of adopting this act. I think also that there would be some danger in repealing our act, because we might not get so good an act through the legislature again.

The only essential difference between the proposed act and the New Brunswick act is that in our act, recognizing that there must be somebody to which town planning schemes can be referred, a body of appeal for final judgment, we name the Governor in Council. That is, the Provincial Government is the final body of appeal, but at the same time the act states that it may be any board which the Governor in Council may appoint for the purpose, and it was clearly understood, when the act was put through between the promoters of it and the Provincial Government, that the Public Utilities Board would probably be the board which would act in that capacity. Our Public Utilities Board has supervision over all public utilities operating in the Province, such as telephones, gas, street railways and that sort of thing, and it is regarded by the government as probably the most suitable board to deal with town planning schemes after they have been adopted by the local boards, which would be appointed by the city councils in much the way proposed in this bill. That is to say, the City Council or Municipal Council has the power to appoint a local board or commission which prepares a town planning scheme. The names of the local board have to be submitted to the Provincial Government for approval, and when the membership of the local board is approved by the government and the local board has been given authority to proceed and prepare a scheme, it can go ahead ; and when the scheme is finally approved by the local government or such board as it may appoint, the scheme then has the same force as if it had been a special act of Parliament.

MR. C. J. YORATH, *Saskatoon, Sask.* :

I wish to bring before the meeting a few points of criticism in respect to the proposed act, which I hope will be taken up by the committee in their further deliberations. The first point which I wish to emphasize is the necessity of this act being made compulsory. At present it is provided that the City Council or the local authority *may* appoint a local board.

It has been found in Great Britain that acts that are voluntary prove a failure, and in the Town Planning Act every local authority must draw up a scheme for a town plan when directed to do so by the Local Government Board.

Again, in this draft act, the question of housing has not been dealt with at all ; and as Mr. Adams pointed out, housing is a very essential part of town planning. The Town Planning Act of Great Britain is in two parts ; the first part deals with housing, and the second part with town planning proper.

Another point which is not taken up in the act is the question of railways. Although Edinburgh has a town plan, it was to a certain extent spoiled by the railways afterwards coming in. Now those of you who represent Canadian cities know the difficulties we have to contend with in connection with the railways. We are at present drawing up a town planning scheme in Saskatoon, and we hope that a certain railway will come into the city. Up to the present we have been unable to find any way to decide what part of the city that railway is coming in, so that it may ultimately spoil a considerable part of our town planning scheme. That is another point I hope the committee will take up when they are considering this bill.

Then with regard to the administration proposed, I will just deal with the local boards. Dr. Hodgetts has stated that the idea of forming a local board is in order to take the authority away from the city council. Now in my opinion that will create a very large amount of friction which should not occur in connection with town planning. The whole procedure should be as smooth as possible. It is recommended that a local board be appointed consisting of two officials, the mayor and two rate-payers, so that you exclude the local authorities. Now what is the outcome of that ? The local authority may not be working in unison with the local board, and as it is provided in the act that any debentures which have to be issued under a town planning scheme have to be issued by the local authority or city council, the city council can kill any town planning scheme.

Then again it is provided by this act that any debentures which have to be issued have got to be submitted to the rate-payers. We may get expert advice in framing the town planning scheme, but whether it is to be ultimately carried out is to be left in the hands of the people, who have no knowledge whatever of the subject.

In closing I should like to ask Mr. Adams one question. Is it not a fact that, in Great Britain, if a number of rate-payers request the Local Government Board to enforce a town planning scheme, the Board can compel the local authority, if they think it desirable, to initiate a town planning scheme ?

MR. ADAMS : It is exactly the same in this act. This makes provision that the central board or the local board may prepare and submit a scheme. If the local board does not act, the central board may do so.

MR. YORATH : But in this case it is "may," not "shall."

MR. ADAMS : Perhaps the chairman will allow me to make just one brief statement which I should have made before. Under the English act a representation may be made by any four rate-payers, and an inquiry has to be held. I have held two inquiries of that kind, but we have not been able to enforce the act, because the Local Government Board is very much against using the *mandamus* which the act provides. In one of those cases we persuaded the authority to carry on a scheme. In the other case the authority refused to act, and although it was a very strong case, we took no action. It is much better if some other method can be used.

Let me just draw your attention to Clause 7, Subsection 2. Those who are studying this act should note that particularly, I think.

"A person shall not be entitled to obtain compensation under this section on account of any building erected on or contract made, or other thing done with respect to land included in a scheme after the time at which the application for authority to prepare the scheme has been made or after such other time as the central board may fix, for the purpose."

Whenever a local authority in England applies to the Local Government Board, before it starts to think out a single detail of its scheme, no owner can do anything to interfere with the proposed scheme. He cannot buy land to prevent a road being constructed or to make money out of the proposed improvement.

I should also have told you before that in England we have 200 authorities at work in this matter. About 90 have either prepared schemes or have applied for permission to prepare them. The other 110 are in course of considering or preparing schemes. The fact that so few schemes are in progress should not influence you, for this reason : that in respect of those 90 areas no owner can do anything to interfere with the proposed scheme. Do not allow the argument to influence you that it takes a long time to prepare a scheme. The main thing is that, after the authority gets permission to prepare it, no speculation on the public improvement is possible.

MR. L. H. GOTCH, *Calgary, Alberta* :

The province of Alberta already has an act, but it has not yet been used in any way, and I am sure that the province will be only



too glad to waive that act and take the one for the whole of the Dominion if that act proves a good one.

In looking through the list of the members of the Committee to draft the act, I notice there is no representative west of Ottawa. It is perhaps difficult to carry on work of this kind with anybody at a great distance from the head office, but I would suggest that perhaps it might be possible to have a corresponding member from some point west of Ottawa. Some conditions that apply in the West are very different from those in the East. One can foresee very considerable trouble in the application of this act in the way of friction between the local board and the city council. For instance, power is given to the local board to purchase sites and receive gifts : yet to obtain any money they have to go to the city authority, and the city authority has to go to the central board for permission to put through a by-law.

Another point is that in the West we have no authorities on town planning, and the Commissioner has to be an authority. The danger that will occur there is that political influence will be used to put into a position of very great authority a man who is not capable of holding that position. That should be very carefully guarded. Too many positions in the West are filled by men who are not really capable of doing the work. It would be a very great mistake if this act were put into force in the West with such men holding power.

The formation of the Committee itself and the local board is also another point that I think the Committee should consider very carefully. It is provided that the Committee shall consist of the mayor *ex officio*, the engineer, the medical health officer, possibly an architect and a financier. Frankly, I think the city engineer and the medical health officer of a small town in the West are the last two persons that one would want to have anything to do with town planning.

HON. GEORGE LANGLEY, *Minister of Municipal Affairs, Regina, Sask. :*

In reference to this bill I want to point out that the proposal, which is, after all, the central proposal of the bill, is a reversal entirely of our democratic order of things. We have been until now, at least in the West, and I believe also in the East, recognizing one authority and one authority only. In our country, at any rate, whatever may be the case among our friends over the line, it is not the court, supreme or otherwise ; but the one central and final authority in the Dominion of Canada is the public authority, and no other.

Well, now, what is this proposal? This proposal is that the governments of the different provinces shall super-impose upon the public a proposal, whether the public agree to it or whether they do not.

I may tell the ladies and gentlemen here assembled that during our session last year we had a town planning committee in the city of Regina. It consisted of Dr. Wilson, who is the head of our normal school, a very capable man and a good scholar, and two other very capable citizens of the city of Regina, who prepared a town planning arrangement and brought it to me to be embodied in legislation. There was no suggestion that we should create an authority that should go to our municipalities and say, "This you shall do because we tell you." We have never done anything of that kind at all, but we have given to our municipalities power to do this or to do that or to leave it undone, as they think proper.

I do not believe that it will be possible to take this bill with the proposal to create a central board to any of the provincial governments of the Dominion with a hope of getting them to adopt it.

I stand in a different position from practically every other gentleman who is a member of this Convention. Upon me will rest in the province of Saskatchewan, and upon men occupying the position I occupy in the other provinces will rest, the responsibility of putting this proposal on the statute book.

I want to say this to our friends of the Committee who have drawn this bill up, and to all our friends who are backing the Committee: that a proposal of this kind in our own province could not be entertained for a single moment. Now I want to say that very plainly. It is not that I am against town planning. I am heartily in favour of it. But this proposal for town planning must, in our own province, be an amendment to the city act and the town act, giving the electors complete authority to say whether it shall or shall not go into effect. And do you not see what it means? It means that you have not to deal with governments; you have to deal with the people. But our people have a conscience, and if the men and women in this Convention are in earnest, as I hope they are, your business is to appeal to the conscience of our people to embody in their laws your wishes in this matter. And unless you do that there is no hope of your getting it carried into effect.

I am sure our American visitors have had a lesson to-day in town planning in the ride we had around this beautiful city. Why, all the desires and hopes and wishes of our American visitors have been put into practical operation right here in the city of Toronto. And there is no reason why the public conscience, which has acted in

the city of Toronto, should not be appealed to all over Canada. Only it means that you, ladies and gentlemen, have got to get out among our people and quicken them until the thought that is in your own mind becomes the thought in the minds of the majority of our people, and then all these things that you desire will go into effect without any trouble whatsoever.

DR. P. H. BRYCE, *Department of the Interior, Ottawa :*

I would like to refer in a word to the remarks of Hon. Mr. Langley, whom I heard last autumn speaking so well in his own city with regard to the province of Saskatchewan and its progress. I have only to say that he has illustrated in many ways the history of the old province of Ontario and the other provinces of Canada, as well as that of the United States in the various cities, and he has illustrated the past ; but this meeting, I hope, is an illustration of the beginning of the future.

At the risk of personal reference I may say that over thirty years ago I started to work here as the secretary of the Board of Health of the province of Ontario, then just constituted by law, with nothing to guide me ; and after two years' experience I said to the premier of that day—Sir Oliver Mowat—"We must have compulsory boards of health if we are going to progress in the work of public health." He put to our committee the possible objections made by Mr. Langley : Are the people ready for it ? Is it necessary ? We urged both, and finally he said, "Get your bill drawn up and we will see." The Public Health Act of 1884 followed, and we got our local boards of health two years after our provincial board was first established. It was the beginning, and the only possible beginning of constructive work in public health.

I take it in this particular matter, after thirty years' observation of our municipalities, that there is nothing in the draft of the bill now under discussion so absolutely essential to development along any correct lines as that of the establishment of a properly appointed central authority for the province with adequate powers. It is very proper for Mr. Langley or anyone else to point out the political difficulties in getting right appointments. That is another affair. The conscience, as Mr. Langley says, of our people is awakening, and it will be for that conscience to indicate in the various provinces who those men will be to whom the work will be given to carry out this magnificent task of town planning and of bringing the conscience of our people to bear on the social questions that we have to deal with.

I see perfectly well the point that Mr. Mitchell has made of the difficulty in the act regarding : How are you going to get the money from the Council ? But in too many cases, as Dr. Hodgetts has



already said, the councils are extravagant and are not very intelligent as to the administration or expenditure of money. The point to be made clear is that you must establish some method by which you can get, so to speak, past such an irregular and indefinite method of expenditure as has been referred to and give your work to a board more or less technical in character. I see no difficulty in this province, or in some of the other provinces, even Mr. Langley's own province if I am not mistaken.

Already we have here, for instance, the Sanatorium Act, passed fourteen years ago, an act by which a by-law for money for the establishment of a tuberculosis sanatorium is to be submitted to the people. Preliminary to that the site and character of the sanatorium have to be established and approved of by the central board. After approval and the money voted, then the county councils appoint a board of trustees, one retiring each year, for five years, to administer the money which the municipality under the act must supply. Nothing is simpler, and in this act there is nothing more included or provided than is already in existence in other acts in this and other provinces of the Dominion.

I shall not go on further except to say that Mr. Adams has illustrated how the conscience and intelligence of England has grown in fifty years. I think it is some fifty years since housing acts of different kinds have been passed in England, and now they have got to the point of giving what we have seen in the Act of 1909, the first concrete example in British countries of what the public conscience and intelligence is demanding, and a perfectly clear and defined method of how it is to be carried out.

HON. P. S. G. MACKENZIE, *Provincial Treasurer, Quebec :*

Like my honourable friend, Mr. Langley, I occupy in the Government and Legislature of the province of Quebec a position of responsibility, and I cannot say off-hand what course our Legislature would be disposed to take if the draft bill now under consideration came before us for legislative action.

In a three-minute speech one cannot go into details. I may say, however, that I came here in a very receptive mood, and I have taken a deep interest in the discussions that have taken place and have received a great deal of most useful information.

I may say that I favour the principle of the draft bill now under discussion, but I hesitate as to the application of many of its details, especially in the province of Quebec. If the bill were to come before our Legislature in its present form, I do not think it could be adopted, as it contains some provisions which are at variance with the general principles of our municipal institutions. It would probably meet

with the opposition of our municipalities, because within the limitations of the general law, and by their charters, they are autonomous. Certain provisions of this bill would undoubtedly conflict with those general principles, especially with regard to the powers of their municipal councils and the rate-payers in financial matters and local taxation. This is a matter, however, of education, and in time, no doubt, great progress will be made.

Indeed we have already made some progress. In 1911, we passed the act known as the *Metropolitan Parks Commission Act*, which applies to the city of Montreal. Under it, rights have been granted to a corporation which has been organized, and, briefly stated, is an auxiliary of the city council, to carry out a certain defined policy with respect to the construction and widening of streets and the making of parks and playgrounds.

It was subsequently found that the provisions of the act were inoperative on account of the lack of sufficient financial provisions to enable the Parks Commission to carry out the object of the act. During last session the act was amended authorizing the adoption of certain financial machinery by which it is hoped that the objects of the bill will be accomplished.

Last session also the Legislature of Quebec adopted legislation which this convention will regard as a step in the right direction. This act is entitled *An Act to Assist in the Construction of Dwelling Houses in Cities, Towns and Villages*. Under this act the formation of companies is authorized for the purpose of acquiring land in municipalities on which to build dwelling houses of reasonable dimensions, supplied with proper improvements and intended to be let at moderate prices, and a municipality is authorized to guarantee, under certain conditions, the payment of the money required for that purpose. It is too early to say if any progress has been made under the act, but I have no doubt that in time it will be generally adopted.

In conclusion, I may say to you that if this question comes up, as come it must—if we are to make progress and if we are to carry out the great humanitarian principles which we have heard discussed so eloquently and with such marked ability in the papers that have been read and the speeches that have been made here—we must progress; and I may tell you that I for one, when the time comes, am prepared to give this measure, whenever it is submitted, the deepest consideration and all the thought I can bestow upon it, in order to aid in bringing about the results which you gentlemen have in view in this splendid and most successful Conference.

DR. C. A. HODGETTS, *Ottawa* :

I must congratulate the honourable the Provincial Treasurer of Quebec on the way he has spoken in reference to a measure of this kind, and also as to the work his province has done with respect to housing. It is certainly a matter that every province must deal with. But, unfortunately, I must say this legislation is not complete. The Committee have in hand the drafting of a bill referring to housing. The health authorities have not the power of condemnation to-day ; they have not the power to condemn the conversion of the single home into the packing box into which scores of individuals are placed, and which is a crime. The Committee have in hand the preparing of a bill to prevent these evils I have pointed out.

This measure, I would like to say, is a measure of public health. There is not a province of Canada or a city of the United States but what passes a great deal of public health legislation and places in the hands of the authorities measures that they do not think of in regard to other matters. And this Town Planning Bill and the House Bill are measures of health. I must remind the honourable member from the West that his province to-day has as strong a public health act as any province in Canada, and we all rejoice in it ; his province has given to one official powers much greater than are asked for here to be given to any official.

MR. LANGLEY : Permit me. I am the head of the Public Health Department of Saskatchewan, and we supply all the money for the administration of that department from the provincial funds. If we had to go to the municipalities for the money, the act would immediately become inoperative.

DR. HODGETTS : In reference to Mr. Mitchell's reference to co-ordination. It was that very thing of departments and departmental officials that the Committee was endeavouring to solve. They are open for suggestions, and hope suggestions will be made as to how best the local body can be formed that will help to co-ordinate municipal work. We all know that with governments and municipal bodies there is a difficulty in co-ordinating the work of the officials in the various branches.

As regards the Chairman's remarks, I would point out that this legislation is simply enabling legislation. He indicated that Toronto wished to do many things in the past that if it was to do to-day would cost the rate-payers untold sums of money. This is simply to enable the city of Toronto, or any other municipality, town or village



that wishes to build wisely and well, to do it under such an act as this if it were passed by the province of Ontario. Therefore, in that respect it is enabling legislation that will enable Toronto to do what it wants to do. If the town of Oakville to the west does not want to do anything like this, then it does not do it.

In reply to the gentleman from Saskatoon, I would say that in Great Britain to-day and in other countries that I have been privileged to visit, an act of this kind is not compulsory. Only a few weeks ago the Rt. Hon. John Burns, before quitting his position of Secretary of the Local Government Board, indicated in a speech given in London that it would be a mistake in England at the present time to make that act compulsory. How much greater would it be a mistake to attempt it here. But if you have legislation, then you can go on and educate the people. I claim that wise legislation should come first and then you will get results.

In respect to railways, we all know in Canada that it is a regrettable thing that our railways receive their incorporation from the Federal Government. The Federal Government not only incorporates railway companies, but telegraph and telephone companies. We find a central legislature giving away to corporations rights and privileges that are denied to the individual. You cannot plant a large telephone pole in front of your house for any purpose unless you get proper permission. In fact I do not think you could get permission to do it at all. But a corporation can come along and plant telegraph poles where and when and how they like. It is the same way with railways. That is one of our difficulties in this country, that the railways receive legislation from the central government, and the central government has very little control over matters with regard to municipalities. However, that is possibly a difficulty that in the future can be solved, as other questions have been solved by proper representation to the Federal authority.

I should like to say in conclusion that if any Canadian, or anybody else, would like to send communications to this Committee on the subject of this bill, we shall be very pleased to receive them. Further, I would add that it is the intention, I believe, of the Commission that as soon as the draft is finally made, it will be sent to the attorney generals of each of the provinces for their consideration and amendments, if any, and then returned to the Commission of Conservation. Nothing will be done hurriedly about it; but it is imperative that something be done speedily. We in Canada must act wisely and well, but not hurriedly.

## RESOLUTIONS ADOPTED AT A MEETING OF CANADIAN DELEGATES

1. Moved by Controller D. McDonald, Montreal, seconded by T. K. Nicol, Parks and Shades Commissioner, Guelph, Ontario, and

*Resolved*, That this representative gathering of Canadian delegates at the International City Planning Conference, held in Convocation Hall, Toronto University, on Wednesday, May 27, 1914, desires to record its grateful recognition and sincere appreciation of the efforts of the Commission of Conservation of the Dominion Government of Canada in the active promotion of the present Congress and in the very manifest interest it has shown in helping to the solution of present municipal problems, common to most cities and towns of the Dominion arising from the need of adequate town planning and housing legislation.

2. Moved by Mayor J. Beaubien, Outremont, seconded by L. H. Gotch, Calgary, and

*Resolved*, That this representative gathering of Canadian delegates at the International City Planning Conference held in Convocation Hall, Toronto University, on Wednesday, May 27, 1914, desires strongly to pray the Commission of Conservation, in view of its very practical co-operation and interest in the aims and objects of the present International City Planning Conference happily promoted by it, to further continue its good work by the creation of a special Bureau of City Planning and Housing in connection with the activities of the Commission of Conservation to act as a central body to encourage and co-operate with provincial or other housing and town planning organizations and thus to pursue the good already attained and furthermore anticipated—a work which we believe will be welcomed by all classes of people of the Dominion.

3. Moved by the Hon. P. G. MacKenzie, Provincial Treasurer of the province of Quebec, and seconded by Alderman W. Bissette, Outremont, and

*Resolved*, That this representative gathering of Canadian delegates at the International City Planning Conference, held in Convocation Hall, Toronto University, on Wednesday, May 27, 1914, respectfully offers its grateful appreciation of the action of the Commission of Conservation in inviting the most helpful presence here of Mr. Thomas Adams, of London, England, whose able manner in laying before the Convention the principles of town planning has been most inspiring and advantageous to our deliberations.

4. Moved by J. Lockie Wilson, Toronto, seconded by F. J. Todd, Montreal, and

*Resolved*, That the Chairman, Mr. J. P. Hynes, Toronto, and Secretary, Dr. W. H. Atherton, Montreal, of the Committee of Resolutions, be instructed to present the above resolutions in person to the Hon. Clifford Sifton, Chairman of the Commission of Conservation.

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## Appendix II

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### Recent Town Planning Progress in Maritime Provinces

#### NOVA SCOTIA

**A** TOWN Planning Act has been passed into law in Nova Scotia which should revolutionize the methods of developing real estate and controlling building operations in that province. A copy of the Act is printed below, and it will be seen that it is to a large extent compulsory.

Under the Act a Local Town Planning Board must be appointed in every urban and rural municipality, and a town planning controller has to be appointed for the whole province. No street can hereafter be laid out, nor any subdivision made unless the plans are approved by this Board. Within three years every Board must either prepare a town planning scheme or a set of town planning by-laws with the minimum requirements set out in Schedule A.

Property is not to be deemed to be injuriously affected for purposes of compensation by reason of the following restrictions on its use, if the Commissioner of Public Works is satisfied that they are reasonable for the purpose of securing amenity :

1. Prescribing space about buildings
2. Limiting the number of buildings to the acre
3. Limiting the height of buildings
4. Prescribing the use or character of buildings, that is, whether the land shall be used for dwellings, etc.

It is an essential part of the Act that there shall be co-operation between municipalities and owners and between adjacent municipalities. Ample safeguards are provided to prevent any person erecting buildings or subdividing land so as to contravene a proposed scheme or by-law, while either is being prepared. The Local Board has power to buy land up to 200 feet in depth on the frontages of new roads or reconstructed roads. The price of any land to be expropriated must be the market value and no extra allowance is to be made for compulsory purchase. The Act has been drawn up in consultation with the Commission of Conservation and immediate steps are likely to be taken to put it into force in the province.

In general principles and in most of its provisions, the Act agrees with the revised draft Act (1915) which has been prepared by the Commission of Conservation. The revised draft is being printed and will take the place of the draft which was submitted to the Toronto Conference in 1914. It will be presented for the consideration of the Saskatchewan Legislature during the current session and other Provincial Legislatures early next year. Meanwhile, the Commission invites the co-operation of City and Town Councils, Boards of Trade, Town Planning Commissions and other bodies, in educating public opinion on the subject of town planning, with special regard to the importance of securing effective legislation on the general lines of the Nova Scotia Act and the Draft Act prepared by the Commission.

#### NEW BRUNSWICK

Although Nova Scotia has now the most advanced Act, New Brunswick is likely to give birth to the first statutory town planning scheme in Canada under its Act of 1912. The city of St. John has appointed a Commission to prepare a scheme and steps are being taken to deal with an area of about 10,000 acres.

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#### NOVA SCOTIA TOWN PLANNING ACT 1915

##### An Act Respecting Town Planning

*Assented to on the 23rd day of April, A.D., 1915*

BE it enacted by the Governor, Council and Assembly, as follows :

1. This Act may be cited as the Town Planning Act 1915.
2. In this Act and in any rule and regulation made thereunder unless the context otherwise requires :

(a) "Commissioner" means the Commissioner of Public Works and Mines.

(b) "Controller" means a Town Planning Controller appointed by the Commissioner.

(c) "Lands" includes lands, tenements and hereditaments and any interest therein, and also houses, buildings and other works and structures.

(d) "Local Authority" means the governing body of a city, town or municipality.

(e) "Local Board" means a Town Planning Board created by a local authority or such Local Board or other authority as may be designated or appointed by the Commissioner as the authority to be responsible for carrying out such scheme.

3. (1) The Commissioner shall make an annual report to the Legislature containing the decisions, recommendations and other transactions of his department under this Act.

(2) The Controller shall be a competent engineer or architect and shall be the executive officer responsible to the Commissioner, and shall perform such duties and shall have such powers as the Commissioner, by regulation, approved by the Governor in Council prescribes.

(3) Every Local Authority shall create a Local Board consisting of the Mayor or Warden and two other members of the Council, (*ex-officio*), and not less than two ratepayers to be appointed by the Local Authority for the term of three years.

(a) Such Board shall be a body corporate, and shall have power to acquire, receive and hold, sell, lease and dispose of lands and any interest therein and personal property.

(b) The Local Board shall appoint as its Town Planning Engineer, Architect or Surveyor, any qualified person who may be the engineer of the Local Authority, and who shall be the executive officer of the Board, and who, with the Local Board, shall be responsible for the carrying out of the provisions of this Act and of the regulations and by-laws issued thereunder by the Commissioner.

4. (1) Except as hereinafter provided each Local Board shall within three years after the passing of this Act prepare a set of town planning by-laws for adoption in its area, and provision shall be made therein for dealing with the matters set out in Schedule "A" attached to this Act, and with such other matters as may be necessary for carrying the by-laws into effect including the suspension of any existing by-laws, rules or regulations which are in operation in the area.

(2) The Commissioner may prescribe a set of model by-laws (or separate sets of model by-laws adapted for areas of special character) for adoption by any Local Board.

(3) All by-laws prepared or proposed to be adopted in accordance with this section of the Act shall be submitted to the Commissioner for approval.

(4) Any Local Board which applies for and obtains consent to the preparation or adoption of a town planning scheme shall not be required to prepare or adopt a set of town planning by-laws under this section of the Act in respect of the portion or portions of its area included in the proposed scheme.



5. (1) A town planning scheme may be prepared in accordance with the provisions of this Act with respect to any land with the general object of securing proper sanitary conditions, amenity, and convenience including suitable provision for traffic in connection with the laying out of streets and use of the land, and of any neighbouring lands for building or other purposes.

(2) The Commissioner may authorize a Local Board to prepare such a town planning scheme with reference to any land within or in the neighbourhood of their area, if the Local Board satisfy the Commissioner that there is a *prima facie* case for making such a scheme, or may authorize a Local Board to adopt, with or without modifications, any such scheme proposed by all or any of the owners of any land with respect to which the Local Board might themselves have been authorized to prepare a scheme.

6. (1) A set of town planning by-laws or a town planning scheme prepared or adopted by a Local Board shall not have effect unless it is approved by order of the Commissioner who may refuse to approve any by-laws or scheme except with such modifications and conditions as he may impose.

(2) A set of town planning by-laws or a town planning scheme, when approved of by the Commissioner, shall have full force and effect.

(3) A town planning by-law or a scheme may be altered or revoked by order of the Commissioner on the application of the Local Board or any interested person if the Commissioner is satisfied that under the special circumstances of the case such by-law or scheme should be altered or revoked.

7. The authority to be responsible for the carrying out of town planning by-laws or a town planning scheme shall be the Local Board applying for approval of the by-laws or scheme, provided that where land included in a town planning scheme is in the area of more than one Local Board, the responsible authority may be such Local Board or other Authority as may be designated or appointed by the Commissioner.

8. (1) The Commissioner shall make regulations for regulating the procedure to be adopted with respect to applications for authority to prepare or adopt town planning by-laws or a town planning scheme, the preparation of by-laws, or a scheme, obtaining the approval of the Commissioner to by-laws or a scheme and any inquiries, reports, notices, or other matters required in connection with the preparation or adoption, or the approval of the by-laws or a

scheme or preliminary thereto or in relation to the carrying out of the by-laws or scheme, or enforcing the observance of the provisions thereof, and for such other purposes as may be found necessary.

(2) Provision shall be made therein :

(a) for securing co-operation on the part of the Local Board with other Local Boards, and with the owners and other persons interested in the land proposed to be affected by the by-laws or included in the scheme.

(b) for securing that notice of the proposal to prepare or adopt by-laws or a scheme be given at the earliest stage possible by public advertisement or otherwise.

(c) for dealing with the other matters mentioned in Schedule "B" attached to this Act.

9. (1) The Commissioner may prescribe a set of general provisions (or separate sets of general provisions adapted for areas of any special character) for carrying out of the general objects of town planning schemes, and in particular for dealing with matters set out in Schedule "C" attached to this Act, and the general provisions or set of general provisions appropriate to the area for which the town planning scheme is made shall take effect as part of every scheme, except so far as provision is made by the scheme as approved by the Commissioner for the variation or the exclusion of any of these general provisions.

(2) Special provisions shall, in addition, be inserted in every town planning scheme, defining in such manner as may be prescribed by regulations under this Act, the area to which the scheme is to apply, and the Local Board or other authority which is to be responsible for enforcing the observance of the scheme, and for the execution of any works which under the scheme, or under the Act, are to be executed by the Local Board or other authority, including the alteration or demolition of any building as far as may be necessary for carrying the scheme into effect, and providing for any matters which may be dealt with by general provisions, and otherwise supplementing, excluding or varying the general provisions, and also for dealing with any special circumstances or contingencies for which adequate provision is not made in the general provisions, and for suspending so far as is necessary for the proper carrying out of the scheme, of any statutes and any by-laws, rules, regulations or other provisions made by a Local Authority, which are in operation in the area included in the scheme.

(3) Special provision shall also be inserted in every set of town planning by-laws and every town planning scheme prescribing the

manner in which the funds necessary for the carrying the by-laws or scheme into effect are to be procured ; provided always that no assessment upon any city, town or municipality shall be authorized by any by-laws or scheme, without the consent of the Local Authority, or Authorities, in control of the area affected being first had and obtained ; nor shall any power to borrow money either by the issue of bonds or otherwise be conferred upon a Local Board by any by-laws or scheme, except with the approval of the Local Authority, or Authorities, in control of the area affected.

10. The amount of any expenses to be incurred in preparing or adopting any by-laws or any town planning scheme, shall be provided by the Local Authority to the Local Board and such amount may be borrowed by the Local Authority ; provided that any amount so borrowed with the interest shall be included in the assessment and rating for the next municipal year, and shall not exceed, for the purpose of preparing or adopting by-laws, one-fiftieth, or for the purpose of preparing or adopting a town planning scheme, one-twentieth of one per cent of the total assessed value of the city, town or municipality.

11. (1) The Local Board may at any time after giving such notice as may be provided in a set of town planning by-laws or by a town planning scheme, and in accordance with the provisions of the by-laws or the scheme.

(a) remove, pull down, or alter any building or other work in the area included which is such as to contravene the by-laws or the scheme or in the erection or carrying out of which any provision of the by-laws or the scheme has not been complied with, or

(b) execute any work which it is the duty of any person to execute under a scheme in any case where it appears to the Local Board that delay in the execution of the work would prejudice the efficient operation of the scheme.

(2) Any expenses incurred by the Local Board under this section may be recovered from the persons in default in such manner and subject to such conditions as may be provided by the by-laws or the scheme.

(3) If any question arises whether any building or work contravenes a town planning by-law or scheme, or whether any provision of a town planning by-law or scheme is not complied with in the erection or carrying out of any such building or work, such question shall be referred to the Commissioner, and unless the parties agree upon some other manner for determining the question, it shall be



determined by the Commissioner, and the decision of the Commissioner shall be final, conclusive and binding on all persons.

**12.** The Local Board shall have power to enter into an agreement with any person or corporation to do any work that the Local Board has itself power to perform, and so far as may be necessary for the purpose of doing such work and such person or corporation shall have all the powers conferred upon a Local Board by this Act.

**13.** (1) Any person whose property is injuriously affected by the making of town planning by-laws or a town planning scheme shall if he makes a claim for the purpose within the time (if any) limited by the by-laws or scheme (not being less than three months after the date when notice of the approval of the by-laws or scheme is published in the manner prescribed by regulations made by the Commissioner) be entitled to obtain compensation in respect thereof from the Local Board.

(2) Any person whose property is injuriously affected by the execution of any works carried out under the provisions of a town planning scheme in respect of any matter or thing which has not been the subject of compensation in connection with the making of the scheme, shall if he makes a claim within twelve months after the completion of such work, or any section of the work affecting such property as the case may be, be entitled to obtain compensation in respect thereof from the Local Board.

(3) A person shall not be entitled to obtain compensation under this section on account of any building erected on or contract made or other thing done with respect to land affected by by-laws after the time when the Local Board makes application for approval of any proposed by-laws or included in a scheme after the time at which the application for authority to prepare the scheme has been made, or after such other time as the Commissioner may fix, for the purpose.

Provided that this provision shall not apply as respects any work done before the date of the approval of the by-laws or the scheme for the purpose of finishing a building begun or of carrying out a contract entered into before the application was made.

(4) Where, by the making of any town planning by-laws or a town planning scheme any property is increased in value, if the Local Board makes a claim for the purpose, within the time (if any) limited by the by-laws or the scheme (not being less than three months after the date when notice of the approval of the by-laws or scheme is first published in the manner prescribed by regulations

made by the Commissioner) the Local Board shall be entitled to recover from any person whose property is so increased in value, one-half of the amount of that increase.

(5) Where by the execution of any works carried out under the provisions of a town planning scheme in respect of any matter or thing which the Local Board has not recovered any amount for increase of value in connection with the making of the scheme, if the Board makes a claim within twelve months after the completion of such work, or any section of the work affecting such property as the case may be, the Board shall be entitled to recover from any person, whose property is so increased in value one-half of the amount of that increase.

(6) Any question as to whether any property is injuriously affected or increased in value within the meaning of this section, and as to the amount and manner of payment (whether by instalments or otherwise), or the sum which is to be paid as compensation under this section which the Local Board is entitled to recover from a person whose property is increased in value, shall be determined by a single arbitrator appointed by the Lieutenant-Governor in Council, unless the parties agree on some other method of determination.

(7) Any amount due under this section as compensation from a Local Board to a person aggrieved, or to a Local Board from a person whose property is increased in value, may be recovered summarily as a civil debt.

(8) Where a town planning by-law or a town planning scheme is altered or revoked by an order of the Commissioner under this Act, any person who has incurred expenditure for the purpose of complying with the by-law or the scheme shall be entitled to compensation from the Local Board in accordance with this section in so far as any such expenditure is rendered abortive by reason of the alteration or revocation of the by-law or the scheme.

**14.** (1) Where property is alleged to be injuriously affected by reason of any provisions contained in town planning by-laws or a town planning scheme, no compensation shall be paid in respect thereof, if or so far as the provisions are such as would have been enforceable if they had been contained in by-laws made by the Local Authority under any other Act.

(2) Property shall not be deemed to be injuriously affected by reason of the making of any provisions inserted in town planning by-laws or in a town planning scheme, which, with a view to securing the amenity of the area affected by the by-laws or included in the scheme, or any part thereof, prescribe the space about buildings,

or limit the number of buildings to be erected, or prescribe the height character or use of buildings, and which the Commissioner, having regard to the nature of the situation of the land affected by the provisions, considers reasonable for the purpose.

(3) Where a person is entitled to compensation under this Act in respect to any matter or thing, and he would be entitled to compensation in respect to the same matter or thing under any other enactment, he shall not be entitled to compensation in respect of that matter or thing both under this Act and under that other enactment and shall not be entitled to any greater compensation under this Act than he would be under the other enactment.

15. The Local Board is hereby authorized to acquire property by gift, purchase, or expropriation.

16. (1) The Local Board may, for the purpose of a town planning scheme, purchase or acquire any land comprised in such scheme by agreement or compulsorily, and in the absence of agreement the price to be paid shall be determined by arbitration, under the rules set out in Schedule "D," attached to this Act.

(2) Such price shall be the market value of the land at the date when the application for authority to prepare the scheme was made and no additional allowance shall be made because of the purchase being compulsory.

17. (1) If the Commissioner is satisfied on any representation that a Local Board

(a) has failed to take the requisite steps for having a satisfactory town planning scheme prepared and approved in a case where a town planning scheme ought to be made ; or

(b) has failed to adopt any scheme proposed by owners of any land in a case where a town planning scheme ought to be adopted ; or

(c) has failed to prepare a set of town planning by-laws dealing with any part of its area not included in a town planning scheme ; or

(d) has unreasonably refused to consent to any modifications or conditions imposed by the Commissioner, the Commissioner may, as the case requires, order the Local Board to prepare and submit for the approval of the Commissioner such a town planning scheme, or to adopt the scheme, or to prepare town planning by-laws, or to consent to the modification or



conditions so inserted. Provided that, where the representation is that a Local Board has failed to adopt a scheme, the Commissioner in lieu of making such an order as aforesaid, may approve the proposed scheme, subject to such modifications and conditions, if any, as the Commissioner may deem fit, and thereupon the scheme shall have effect as if it had been adopted by the Local Board and approved by the Commissioner.

(2) If the Commissioner is satisfied on any representation after holding a local inquiry, that a local Board has failed to enforce effectively the observance of a by-law or a scheme which has been confirmed, or any provisions thereof, or to execute any works, which, under the scheme or this Act, the Local Board is required to execute, the Commissioner may order the Local Board to do all things necessary for enforcing the observance of the by-law or the scheme, or any provisions thereof effectively, or for executing any works which under the scheme or this Act, the Local Board is required to execute.

(3) Any order under this section may be enforced by mandamus.

**18.** The Local Board, with the approval of the Commissioner, may purchase or expropriate under the provisions of this Act neighbouring private property, within 200 feet of the boundary lines or proposed boundary lines of any street, public park, playground, or other open space.

**19.** (1) Notwithstanding any statutes, by-laws, rules or regulations in operation in the area, no street, road or public right-of-way shall hereafter be reserved, laid out, granted, or conveyed, and no property, tract of land, or area shall be subdivided or sold as lots unless in accordance with plans, sections, and particulars submitted to and approved of by the Local Board or by the Local Authority pending the appointment of the Local Board.

(2) The Local Board shall make regulations with regard to the procedure to be adopted with respect to applications for approval of such plans, sections and particulars, and such regulations when made shall not come into effect until and unless approved by the Commissioner.

**20.** Any expenses incurred by the Commissioner under this Act shall be paid out of any funds appropriated for the purposes by the Legislature of the Province.

**21.** Chapter 6 of the Acts of 1912 is hereby repealed.

## SCHEDULE "A"

1. Fixing building lines on all existing roads to secure, as far as practicable, having regard to the physical features of the site and the depths of the existing subdivisions, that the distance between the buildings to be erected or buildings likely to be reconstructed on opposite sides of a road shall not be less than 60 feet and shall not exceed 100 feet according to the prospective traffic requirements of such road provided that the distance may exceed 100 feet by agreement between the Local Board and the owners of the land affected.

2. Fixing building lines on all new roads to be made in future so that no building shall be nearer to the centre of any road than 40 feet in the case of main thoroughfares or 30 feet in the case of all other roads.

3. Reserving of land for new main thoroughfares which it is desired to keep free from buildings, by agreement with the owner or owners of such lands and by co-operation between Local Boards.

4. Limiting of the number of separate family dwelling houses to the acre and the extent of each subdivision to be built upon, and securing adequate light and air to the windows of each house, as far as reasonable for the purpose of this Act.

5. Prescribing certain areas which are likely to be used for building purposes for use for separate dwelling houses, apartment houses, factories, warehouses, shops, stores, etc., and the height or general character of buildings to be erected or re-constructed, so far as reasonable for securing the amenity of such areas.

6. Providing for the following or other variations in the widths of streets :

(a) New main thoroughfares to be of a width of not less than 60 feet.

(b) New secondary streets likely to be required for through traffic to be of a width of not less than 40 feet.

(c) Streets not exceeding 350 feet in length and, in the opinion of the local authority, not required for through traffic to be of a width of not less than 24 feet with a carriage-way not less than 16 feet and connected at both ends with a street not less than 40 feet wide.

(d) Streets not exceeding 700 feet in length and, in the opinion of the local authority, not required for through traffic

to be of a width of not less than 28 feet, with a carriage-way not less than 18 feet and connecting at both ends with streets not less than 40 feet wide.

(e) Streets not exceeding 1500 feet in length and, in the opinion of the local authority, not required for through traffic to be of a width of not less than 32 feet, with a carriage-way of not less than 20 feet and connecting at both ends with a street not less than 40 feet wide.

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### SCHEDULE "B"

1. Procedure anterior to and for the purpose of an application for authority to prepare or adopt a scheme.

(a) Publication or deposit for inspection of map of proposed area and estimate of cost of preparing scheme by the Local Board.

(b) Submission of maps and estimates to Commissioner.

(c) Publication of notices.

(d) Hearing of objections and representations with regard to the boundaries or extent of the area, by persons interested.

2. Procedure during, on and after the preparation or adoption and before the approval of the scheme.

(a) Submission to the Commissioner of the proposed scheme with plans and estimates.

(b) Notice of submission of proposed scheme to the Commissioner.

(c) Hearing of objections and representations by persons affected, including persons representing architectural or archæological societies, or otherwise interested in the amenity of the area.

(d) Publication of notice of intention to approve scheme and the lodging of objections thereto.

3. Procedure after the approval of the scheme.

(a) Notice to be given of the approval of the scheme.

(b) Inquiries and reports as to beginning and the progress and completion of works and other action under the scheme.

4. Procedure for the purpose of an application to prepare or adopt town planning by-laws.

(a) Publication of notice of proposed application and deposit for inspection of draft by-laws and maps (if any).



(b) Submission of draft by-laws and map (if any) to Commissioner.

(c) Hearing of objections and representations by persons interested.

(d) Publication of notices of intention to approve by-laws and hearing of objections to modifications made.

(e) Deposit of by-laws as approved by the Commissioner and publications of notice of approval.

5. The details of schemes to be specified in plans, including wherever the circumstances so require, the restrictions on the number, location, purpose and dimensions of buildings which may be erected on each area, and the height and character of such buildings.

6. Duty of Commissioner to hold or order holding of any public inquiry which he deems necessary or desirable.

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## SCHEDULE "C"

### MATTERS TO BE DEALT WITH BY GENERAL PROVISIONS PRESCRIBED BY THE COMMISSIONER

(1) Streets, tramways, roads and other ways, including stopping up, altering or diverting of existing highways.

(2) Buildings, structures and erections.

(3) Open spaces, private and public.

(4) The preservation of objects of historical interest or natural beauty.

(5) Sewerage, drainage and sewage disposal.

(6) Lighting.

(7) Water supply.

(8) Ancillary or consequential works.

(9) Extinction of, variation of, private rights-of-way and other easements.

(10) Dealing with or disposal of land acquired by a Local Board.

(11) Power of entry and inspection.

(12) Power of the Local Board to remove, alter or demolish any obstructive work.

(13) Power of the Local Board to make agreements with owners, and of owners to make agreements with one another.

(14) Power of the Local Board to accept any money or property for the furtherance of the objects of any town planning scheme, and provisions for regulating the administration of any such money or property.

(15) Application with necessary modifications and adaptations of statutory enactments.

(16) Carrying out and supplementing the provisions of this Act for enforcing schemes.

(17) Limitation of time for operation of scheme.

(18) Co-operation of the Local Board with the owners of land included in the scheme, or other person interested by means of conference and other means.

(19) Charging on the inheritance of any land the value of which is increased by the operation of a town planning scheme the sum required to be paid in respect of that increase, and for that purpose applying, with necessary adaptations, the provisions of any enactments dealing with charges for improvements of land.

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## SCHEDULE "D"

### REGULATIONS AS TO EXPROPRIATION OF LANDS

(1) Wherever under a town planning scheme it is provided that land may be purchased for any purpose connected with the scheme the Local Board may contract for the purchase of such land or interest therein with the owner thereof.

(2) If :

(a) no such contract can be made, or

(b) such owner or person does not reside within the province or is unknown by the Local Board so to reside, or

(c) a good title cannot be made to such land or interest therein, or the owner or any other person interested therein is incapable of executing a good conveyance thereof, or

(d) for any other reason it is deemed advisable so to do, the Local Board may by resolution determine to expropriate such land or interest therein.

(3) If any such owner or other person having the power to sell fails to answer an offer in writing by the Local Board to purchase any such land or interest therein within thirty days after the receipt thereof, such failure may be deemed a refusal to contract.

(4) The engineer of the Local Board shall prepare a plan and description of the land proposed to be expropriated and a report on the matter of such expropriation, and submit the same to the Board.

(5) For any purpose connected with any such contemplated expropriation any engineer or other officer of the Local Board, his associates and servants may enter upon any land in respect to which the expropriation is contemplated, and survey or examine the same, and if necessary in his judgment, may make borings or other excavations therein, and if such expropriation is not made, any damage to the land shall be paid for by the Local Board.

(6) A copy of such plan and description as approved by the Local Board shall be lodged in the office of the engineer where the same may be inspected by any person interested.

(7) If the owner of the land or interest therein intended to be expropriated resides within the province, and is known to the Local Board, the engineer shall give him notice in writing of the intention of the Local Board to expropriate such land or interest therein but the notices required to be given under the procedure regulations of the Commissioner shall be deemed to be sufficient notice for the purposes of this Act.

(8) It shall not in any case be necessary to serve any mortgagee of any land sought to be expropriated with a copy of such notice.

(9) At the expiration of two weeks from the giving of such notice, the Local Board may, by resolution, declare the land or interest therein to be expropriated, and shall pay into the Supreme Court such sum as in the judgment of the Local Board is a reasonable compensation for the land or interest therein expropriated, and notice of such payment shall be given to such person and by such publication as is hereinbefore provided in respect to the notice of intention to expropriate.

(10) A copy of such resolution, with a copy of the plan and description shall be lodged for registry in the registry of deeds.

(11) Upon the passage of such resolution the making of such payment and the lodging for registry of such documents, the title to the land or interest therein declared to be expropriated shall be absolutely vested in the Local Board free from any encumbrance or lien of any description whatever.

(12) If any resistance or opposition is made by any person to the engineer or other official of the Local Board entering upon and taking possession of any lands on behalf of the Local Board, a judge of the Supreme Court, on proof of the passing of such resolution, the lodging of such plan in the office of the engineer and the registrar of deeds and the payment of the money into Court, and after notice



to show cause given in such manner as he directs may issue his warrant to the sheriff of the county within which such lands are situated, directing him to put down such resistance or opposition, and to put the Local Board in possession thereof: and the sheriff shall take with him sufficient assistance for such purpose, and shall put down such resistance and opposition, and shall put the Local Board in possession thereof; and shall forthwith make return to the Supreme Court of such warrant and of the manner in which he executed the same.

(13) If the owner within one month from the service upon him of such notice of payment gives notice in writing to the Local Board that the amount of such compensation is insufficient and names a person as arbitrator, the Local Board shall forthwith name an arbitrator, and the two so named shall appoint a third, or if they are unable to agree, such third arbitrator shall be appointed by the Commissioner and the three arbitrators so appointed shall determine the amount of such compensation, and shall file their award with the executive officer of the Local Board and the provisions of the Arbitration Act shall apply to any proceedings had by the arbitrators. Provided that no expert witnesses as to value shall be called except by request of the arbitrators.

(14) The owner and the Local Board may, if they see fit, appoint one person sole arbitrator, and the compensation may be determined by him.

(15) If the owner does not give such notice and name an arbitrator within one month, he shall be deemed to have accepted the amount of compensation so paid into Court as sufficient, but in such case any holder of any charge or incumbrance on the land expropriated, or otherwise interested therein, may give such notice and name an arbitrator within one week from the expiry of the month, and the arbitrator shall proceed accordingly.

(16) Every arbitrator shall be paid by the Local Board the sum of six dollars for each separate parcel of land or interest in land compensation for which is arbitrated on by him.

If any case requiring an unusual amount of time or labour the Local Board may pay the persons employed as arbitrators such additional sum for their services as it sees fit.

(17) In the event of the Local Board proceeding to expropriate any tract of land being the property of more than one person, the Board may give notice by advertisement for two weeks in one or more daily newspapers published in the locality of a time and place at which the owners of lands proposed to be taken may meet, and may also give notice of such meeting by letter prepaid to such of

the owners as are known ; but the want of the notice by letter shall not affect the expropriation proceedings in respect to any property. Such meeting shall be presided over by the Mayor, Warden or other person appointed by the Local Board.

At such meeting the said owners may, by a majority vote of those present, nominate a person to be one of the arbitrators to determine the compensation to be paid by the Local Board for the respective lands so taken.

If such owners fail to meet or to appoint a person at such meeting, a judge of the Supreme Court may, on the application of the Local Board, appoint a person to be such arbitrator.

The Local Board shall appoint one person to be an arbitrator for such purpose.

The two persons so appointed shall appoint a person to be a third arbitrator and if they are unable to agree upon any such person a judge may, on the application of the Local Board or any owner, appoint a person to be such third arbitrator.

The three persons so appointed shall be the arbitrators to determine the compensation to be paid in respect to each of the properties so expropriated.

(18) In determining the amount of compensation to be paid for any land expropriated for any purpose of a town planning scheme, the arbitrators shall take into consideration the relative benefit and injury occasioned to any remaining portion of the owner's land, by carrying the scheme or any portion thereof into effect, adding thereto an estimate for the cost of fencing such portion, if rendered necessary. The amount of such estimate for fencing need not be paid into court but may be paid to the owner on such fencing being completed.

(19) If the amount of compensation determined by the arbitrators exceeds the amount paid into court, the Local Board shall pay the amount of the excess into court. If such amount is less than the amount paid into court, the difference may be paid out to the Local Board on application.

(20) Any money paid into court on account of any expropriation shall be subject to every lien, incumbrance or other charge to which the land or interest therein expropriated was subject.

(21) Any money paid into court may be paid out to the person or persons entitled thereto on application to a judge of the court, notice of such application being first given to the Local Board, and on such application the judge shall make such orders and direct such notices to be given as he deems necessary to protect all persons interested in the money so paid in.

(22) If upon any application for the payment out of money, a certificate of title is required, the registrar of deeds shall furnish the same for a fee of three dollars, to be paid by the Local Board.

(23) The Local Board shall pay the cost of any such application not exceeding fifteen dollars in all.

(24) A Local Board may be authorized by the Commissioner to sell any land purchased or expropriated under a town planning scheme, if it can be shown that the purpose for which the land was acquired has been attained, or that the land is no longer necessary for any purpose of the scheme and the moneys realized from any such sale shall be applied, in the first instance, to the payment of any debt incurred in connection with such expropriation, and for that purpose may be used for the payment of the instalments of any loan contracted for such debt, or may be paid into any sinking fund established in connection therewith, or into the general sinking fund, as may be most appropriate, and in the second instance, for such purpose in connection with the scheme as may be approved by the Commission.

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## Appendix III

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### Recommendations for the Creation of Three New National Parks in Canada\*

BY

P. A. TAVERNER

*Geological Survey of Canada*

THE object of the creation of National Parks is to conserve the natural benefits derived from objects, scenes and localities of peculiar national interest and prevent their private exploitation by a privileged few to the disadvantages or damage of the nation in general.

These benefits may be æsthetic, scientific or economic, or a combination of any or all of them. Objects of great beauty are a source of national pride to the people as a whole and an attraction to visitors from other localities ; thus forming practical assets both to the immediate vicinity and the country as a whole.

Some localities are of special scientific interest and exhibit natural phenomena under conditions particularly well adapted for study to the advance of the world's knowledge and the increase of the nation's intellectual development and prestige.

Other natural resources have a direct economic bearing upon the welfare of the nation and their preservation must be looked upon as an economic necessity to our national life.

In my past two years of field work, I have come across two sections of our country that fulfil one or more of these requirements to a marked degree and hence undoubtedly should be preserved ; not only for our contemporaries, but for posterity as well.

Incidentally, none of these points cover land of other or conflicting importance and unless rescued for the above purposes will always be waste land of little or no economic value.

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\*A memorandum addressed to the Commission of Conservation, Ottawa, and published by the permission of the Deputy Minister of Mines.

## POINT PELEE, ONTARIO

Point Pelee is a low, triangular sand spit projecting into the waters of lake Erie near its western end. It is roughly six miles across at the base and extends about nine miles south into the lake, forming the most southerly extension of mainland in the Dominion.

In general formation it is composed of two narrow sand bars joined at their extremities and flaring out at the sides into a broad V where the arms join the main shore line. At the apex, the arms amalgamate to form a small triangle of solid land less than a mile across at the widest, and tapering to nothing at the extremity ; perhaps two miles away. The remainder is a large swamp dotted with occasional open water separated from the lake by narrow causeways of sand, hardly wide enough to protect the centre from breaking seas and storms. One of these causeways is bare, wind-blown sand, but the other is covered with a substantial growth of timber.

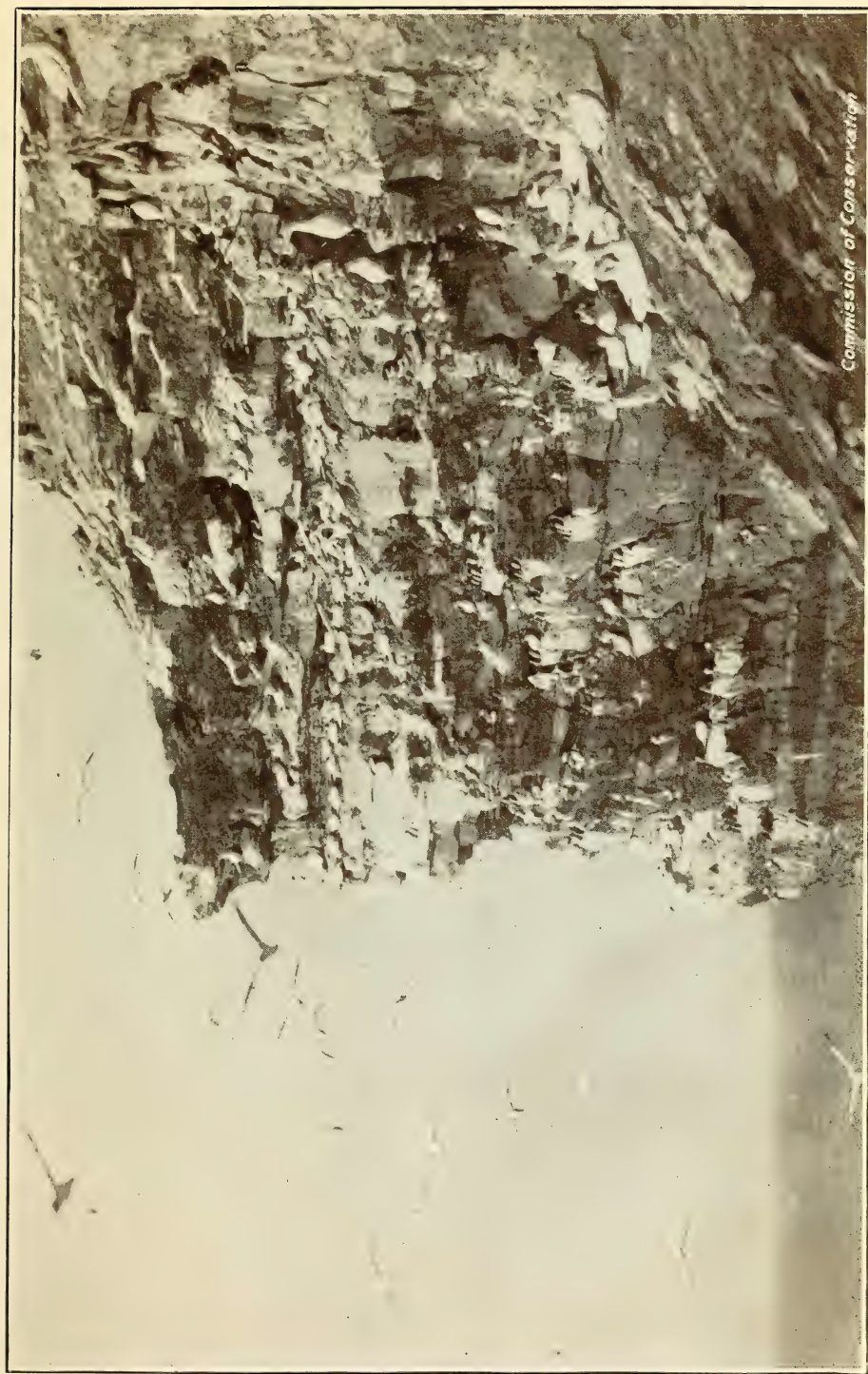
The soil is light and sandy and, though broken here and there by small farms, is but poorly productive and requires continual artificial fertilization to produce paying crops. As farming land it is of small value. The other interests on the point are the fisheries along its shores and the sale of sand for building purposes ; of this latter more anon.

Point Pelee is the most southerly point of the Dominion, biologically as well as geographically, and thus we find a fauna intruding from the south that occurs in no other part of the Dominion in so marked a manner. Such trees and plants as paw-paw, prickly pear, sassafras, sycamore, black walnut, hackberry, wahoo, red mulberry and other strictly southern forms thrive here. And birds like cardinal, Carolina wren, yellow-breasted chat, blue-gray gnat catcher, golden-winged warbler are common residents or regular migrants, while mockingbirds, summer tanagers, dicksessels, lark sparrows, grasshopper sparrows, tufted titmice, Bewick's wrens, blue-winged warblers, prairie warblers and others of like southern distribution are more or less regular in occurrence.

Besides these peculiar faunistic characters the point forms one of the most important migration highways in America and is a station from which such phenomena can be studied with extraordinary advantage, as almost incredible numbers of birds follow along its length on both their spring and autumn journeys.

In physical aspect, point Pelee is a place of unusual and peculiar beauty, resembling strongly in many particulars the landscape of the Bermuda islands, and is unique in the Dominion.

As a play and recreation ground the point should, even though little known, almost justify its reservation for that reason alone. The



*Commission of Conservation*

THE LEDGES, BIRD ROCK, GULF OF ST. LAWRENCE





grateful shade of its red cedar thickets and heavy oaks, black walnut, and hackberry timber make ideal camping places for the tired city resident ; the broad sand beaches make excellent bathing and play ground for children ; while the magnificent aquatic and piscatorial offerings round out and complete the pleasures that can be enjoyed.

Economically, the point offers an important position on the lake. Stretching out nine miles into the lake it offers the only shelter for miles along the coast from the strong east and west winds that sweep the lake, and ships often lie in its lee for days during the severe storms that devastate this most dangerous of the Great lakes.

Under present conditions of private ownership the very permanency of the point itself is threatened, and it is rapidly being shipped away as sand for concrete work to the adjoining cities of the United States.

Permits have been granted to take sand from the lake bottom at a certain distance from the shore. This, looking harmless enough, is having a grave effect on the point. Owing to its being entirely a sandy formation, every ship load of material removed in this manner is, eventually, replaced by sand washed from the shore. In 1913, it was estimated that enough sand had been thus removed to cover 15 acres, two feet deep. It is obvious that such depredations as this can continue for but a limited time before the very existence of point Pelee is seriously affected. That this fear is founded upon more than mere speculation is evident from the history of the place within the past generation. Men still in the prime of life can remember when they could walk out, dry shod, nearly to the "dummy light" at present situated three miles off the end of the point. My first experience on the ground was in 1905. Since then, the end of the point has receded at least half a mile, the greater portion of which loss has occurred between 1911 and 1913, when my last visit was made. It is rumoured that a company has lately been organized for a still more wholesale selling of sand, and all the land from the farthest point back to the end of the marsh, or one-half of the dry land, has been secured for this purpose with the avowed intention of shipping it away.

The profit of all this comes merely to the few owners of the ground ; giving them perhaps comfortable incomes, but the country as a whole is the loser, by just that much land and interest. The Dominion does not even gain the use of the material in her own work, for practically all of it goes to the United States to build up the American ports on the south shore of the lake.

Large portions of the point are still in the possession of the Crown, and I understand are under the administration of the Department of the Naval Service. The land that has been alienated from their control constitutes but the cleared and farmed portions that have been secured through squatters' claims. It is a peculiar commentary upon the conduct of affairs, that, while the remainder of the land cannot be purchased from the Crown for human occupancy, the whole can be obtained under royalties and shipped bodily away and out of the country as building sand.

The great area of swamp in the interior of the point has been largely dyked off, drained, and pumped out, making areas of valuable farm land of remarkable fertility. This has been carried out along the basal half of the point nearly to the line of government ownership. The remainder of the point, comprising an area of about five square miles, is two-thirds swamp. Of the dry land only about one-quarter is cleared. Of this less than half is actually under cultivation, of a kind, and the value of all for agricultural purposes is small. About  $\frac{5}{8}$  of the point is, therefore, owned by the government, and could be reserved for park purposes without expense, and the remainder would cost a relatively small amount except for the lands that are occupied by the before mentioned sand company. These, however, could not be extensively worked without damage to land still owned by the Government. This would be a strong argument to reduce the expense of acquiring the Company's rights, even if the whole proposition could not be condemned as against public policy.

There remains but one other activity, the shooting on the point, to be considered, as the fishing rights need not necessarily be disturbed in making the locality a national park. The Government-owned marshes have, at various times, been leased to shooting clubs. These, while they had full control of the premises, by careful protection kept up the supply of game to a high standard. The clubs limited the bags of their members, also the number of guns and of shooting days, kept off poachers during close season, and birds were attracted to the locality by feeding and by other measures. Since the marshes have been thrown open to the public, this has all been changed. The protection against poaching has not been as efficient as under club regime, and no other restrictions have been observed than the Provincial laws could enforce. The place has been over-shot and under-protected and nothing done to attract game. The consequences are : That an ideal breeding ground for wild fowl is now nearly deserted. The opening days of the autumn shooting see considerable numbers of early migrant and resident ducks on the marshes ; but it is immediately invaded by a multitude of guns,



and the resultant continuous fusilade drives them all away the first day or so, and the shooting is thus practically over for the season.

The establishment of these marshes as a bird sanctuary would undoubtedly result in its immediate repopulation, and make it a focus from which the annual increase could spread out and afford increased sport to the surrounding country.

I should advocate then the governmental acquisition of the few privately owned lands on the point. The making of it all into a National park and bird reservation, and the employment of one of the most experienced resident shooters as keeper or warden at a nominal salary ; and the withdrawing of the sand-taking privileges now allowed from the waters off the point.

The fishing industries need not be interfered with, and might continue as heretofore, the fishermen occupying the ground necessary for their work under nominal rentals.

Camping privileges might be allowed under proper restriction and supervision, that the benefit and enjoyment of this most interesting and unique locality may be available to everybody.

#### PERCÉ ROCK AND BONAVENTURE ISLAND

Percé rock is an immense rocky fragment set down in the edge of the sea off the southeast corner of the Gaspé peninsula, off the north mouth of the bay of Chaleur, gulf of St. Lawrence.

It is an isolated mass 1,200 feet long and nearly 400 feet high with practically perpendicular sides and averaging less than 80 feet through in width. In general outline it strongly resembles the hull of an enormous battleship, just leaving the ways and making its first plunge stern first into its proper element. This is the effect of a view from the nearby shore. From farther away a broadside view may be obtained and thus it is seen that a little aft of amidship an heroic arched opening is pierced completely through the mass springing from the sea level, a hundred feet in span and nearly as much in height. It is this arch that has given the rock its name of "Percé" or pierced. Up to historically recent times another opening penetrated its mass, but its top fell within the memory of recently living inhabitants, and a chimney-like shaft, isolated at the outward end of the rock, marks the outer abutment of this old arch. On all sides the rock rises sheer and has been unclimbable without elaborate artificial aids for many years past.

The rock is highly coloured with red, but locally streaked with yellow, blue and green, that, broken up by shadows from the rough masses and the various freaks of falling sunlight, present a kaleidoscopic effect. This in connection with the great mass, heroic scale

and rugged isolation of the whole, with the sea forever breaking in foam about its base, makes an object of wonderful and impressive beauty.

The top is comparatively level and has been taken possession of by innumerable herring gulls and cormorants. The former in breeding season cover its surface so completely as to appear like snow, while the latter, perched on the slight rolling elevation above the general level, punctuate the scene with strikingly graceful outlines of jet black.

About the noble prows of the rock almost continuously-present flocks of great white gulls whirl hither and thither like snow flakes in a squall, adding the touch of wild life that accentuates the lonely beauty of the rock.

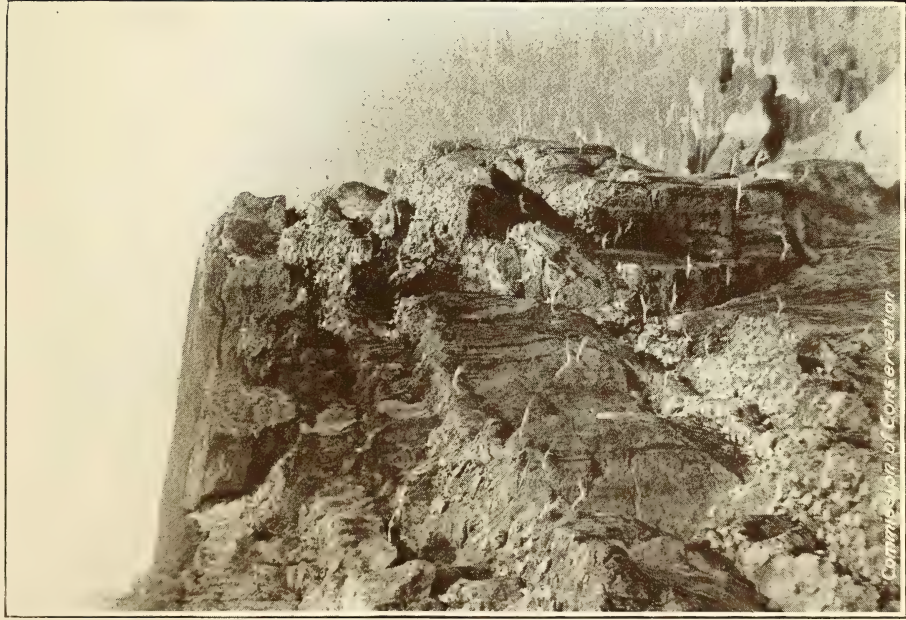
Already overtures have been made for the purchase of this noble rock by private parties ; but though they have been refused there is no telling when it will become subject to the private exploitation of mercenary parties. As it is, the birds that one would expect to be safe on its inviolable surface have been threatened with destruction, and have been, and still are, subject to more or less petty destruction from idle sportsmen (?) about the base.

Such a national monument should be enrolled immediately among the nationally owned wonders of the Dominion, for then, and not until then, can we be certain that its beauty will not be sacrificed to private greed, and that it will remain to be a joy and an inspiration to the people of the Dominion forever.

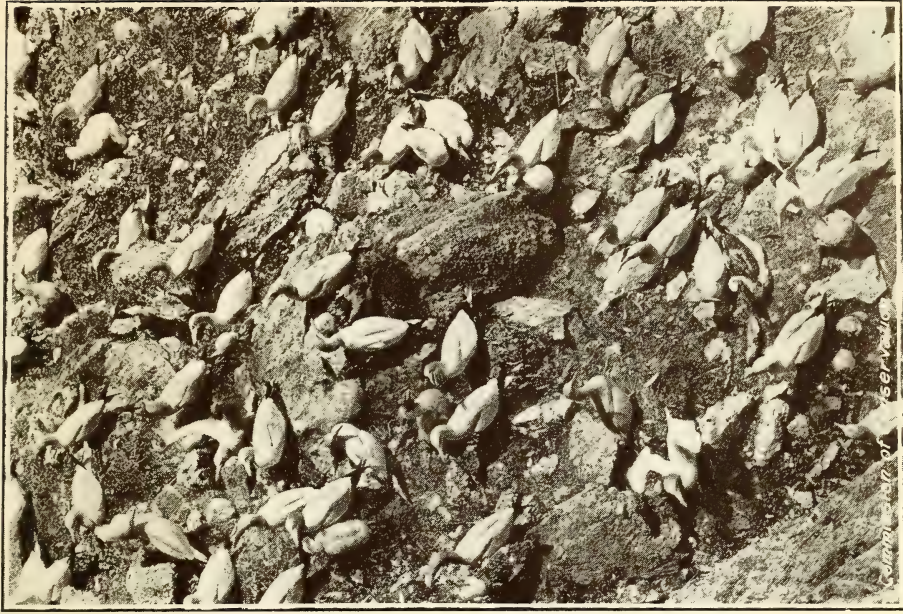
Bonaventure island lies off shore about three miles south-west from, and in plain sight of, Percé rock. It is roughly circular in outline, about three miles across, and is bounded for most of its circumference by steep forbidding cliffs. Its greatest interest, however, lies in the cliffs on the south and seaward face, where they rise perpendicularly from the sea to a height of over 300 feet, and are covered with clouds of snowy sea birds nesting on the ledges in the crannies of its face. The species represented are gannets, murre, razor-billed auks and puffins, with the first out-numbering all the rest.

The gannet is a large bird with an expanse of wings of over five feet, creamy white in colour, and with jet black primaries. It is one of the most inspiring flyers and magnificent divers in the world. The sight of a flock of gannets diving for food from a height of a hundred feet or more in the air is an impressive one, as they close their wings and drop perpendicularly like plummets into the sea, one after another pouring into it, as it were, like white beans from a bag. They feed on deep sea fish, and though the toll they take must be





BONAVENTURE ISLAND, GASPE CO., QUE.  
GANNET LEDGES, 1914, 1,576 Birds



BONAVENTURE ISLAND GANNET LEDGES, 1914  
Near view of some of the birds.





considerable in the mass, the relative damage they do is infinitesimal, as not even the crankiest fisherman seems to begrudge their takings. Once the gannet nested in numerous localities from the bay of Fundy to beyond the strait of Belle Isle ; but one by one they have been driven away and their rookeries have been broken up. To-day, in all the new world, the species nest but upon these ledges of Bonaventure island and on Bird rock of the Magdalen islands out in the open gulf of St. Lawrence.

The past summer of 1914 we estimated that there were about 7,500 birds nesting on Bonaventure island. Reports credit some 8,000 to Bird rock ; so probably the total population of the species in America is less than 16,000 individuals.

They nest on the ledges and slight irregularities on the face of the seaward side of Bonaventure island, for the distance of about half a mile ; though half of that would include the great majority of nests. Viewed from the sea it looks as if the horizontal ledges of the rock were covered with snow, and as the birds are disturbed and leave, it strongly recalls from a distance the scurrying eddies from wind-blown drifts.

One can approach close to the cliffs as the water is deep and, looking up from a small boat, the sight of line after line of closely packed immaculate birds is a strange one, and ranks with many of the natural wonders of the Dominion in interest.

Though the nesting ledges can be reached with but the greatest difficulty, even here the poor birds are not free from persecution. Occasionally, boys and young men, who should know better, angle for them with fish lines and hooks, from above. Skirting along the base in a power boat, the birds can be, and are, killed until ammunition is exhausted, or the sport palls on the shooters. Even pot-shots are taken at the birds sitting on the nests to see how many can be killed at one discharge ; as we saw one day when we climbed to the most accessible ledges and found corpses laid out on their nests with young almost dead, but still brooded under the lifeless bodies of their parents.

This is one of the recognized forms of sport in the neighbourhood, and scarcely a week goes by during the winter when a boat load of idle fishermen, or others, do not engage in the slaughter. One day after such an event performed by a party from Gaspé, we found nine dead gannets on the wharf at Percé where they had been left by the triumphant sportsmen, and counted over fifty dead and wounded ones about the cliff base under the ledges.

The birds so shot are not used for food or feathers ; they are left to lie where they fall after the passing curiosity of the shooter is

satisfied. Such wanton slaughter should be controlled and stopped. The species, while of no economic importance, is nearing extinction, and every effort should be made to conserve it from final disappearance.

The area they occupy is a rocky cliff face and could be declared a bird reserve or National park without injury to anyone, or the withdrawing of a square foot of land from cultivation or economic use.

I, therefore, recommend that Percé rock, and the Birds' ledges of Bonaventure island, be included in the National park system of the Dominion, and a resident of Bonaventure island be appointed warden of the place at a nominal salary to see that the park regulations are enforced.

The localities here considered in this connection are :

Point Pelee, Essex county, Ontario,

Percé rock, at the extreme of the Gaspé peninsula, in the province of Quebec, and a part of Bonaventure island adjoining.

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